

The Iron Age

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A Review of the Hardware, Iron and Metal Trades.

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Published every Thursday Morning by DAVID WILLIAMS, Nos. 66 and 68 Duane Street, New York. Entered at the Post Office, New York, as Second-Class Matter.

Vol. XXXVIII: No. 20.

New York, Thursday, November 11, 1886.

\$4.50 a Year, Including Postage.
Single Copies, Ten Cents.

Interchangeable Shaft Couplings.

BY J. RICHARDS.

It is now more than 20 years since interchangeable shaft couplings were made and offered for sale in this country. Perhaps no other article of engineering manufacture of equal importance and extended application has ever been so long in coming into general use. For this there are sufficient reasons, no doubt, and the present article will be an attempt to explain some of them.

Pulleys, hangers, bearings, collars, and so on, have long been made interchangeable; this the market demands, and no one thinks of making them otherwise, but

functions and purpose of interchangeable couplings are a problem he does not so well understand. If, however, interchangeable couplings had the same importance in use as they have in manufacture, and they have a great deal in both, consumers—or the market, it may be called—would long ago have settled the matter. This is one reason why interchangeable couplings have not come more rapidly into use, but it is not the only one, perhaps not the main one. The inventors and makers of such couplings have not succeeded well in producing them of the required strength, nor at a price that compares favorably with flange couplings, and they have a fault of running out of truth. I think the facts

these couplings and all others of the class is that there is no adjustment and they are expensive to make, requiring accurate special machine tools. In respect to adjustment, I trust it will not be a new proposition to the readers of *The Iron Age* to claim that a conical fit does not permit adjustment. It seems to, and it is not unusually met with as a means of adjustment, but is a mechanical "myth." Any one can try the experiment, even with a long taper, and find when a fit is reached there is nothing beyond, and no more movement is possible; hence shafts held in this way must be accurate in size the same as though the couplings were solid; otherwise they run out of truth and the couplings fail.

may be seen, no member performs a double function, and the weight must be considerable more by reason of this distribution. The present and other diagrams that have preceded are not drawn to scale. They are to illustrate methods and not to give proportions. This latter will form an interesting subject for competition and discussion by mathematical readers. The coupling just described forms an admirable subject. The sections are all determinable by computation, or approximately so, from the strength of the coupled shaft.

With this much in the way of general remarks I will now proceed to give some experience and observations respecting shaft couplings. In 1869 after trying cone coup-

in Figs 10 and 11. The cones were cut away on the periphery, as shown in Fig. 11; otherwise the construction was the same as the Sellers coupling, except that round bolts were employed. The couplings would run true only when the shafts were accurate, and go to pieces regularly whenever the strain was excessive. It may be mentioned that on the Pacific Coast a great share of the shafting made is to drive wheel gearing and other positive work, and couplings must be at least as strong as the shafts they connect. After trying two other kinds of couplings by other makers I reverted to the "clamps." These, it was known, would hold under all circumstances, but the rough exterior was a difficulty. Drawings were made with cover-

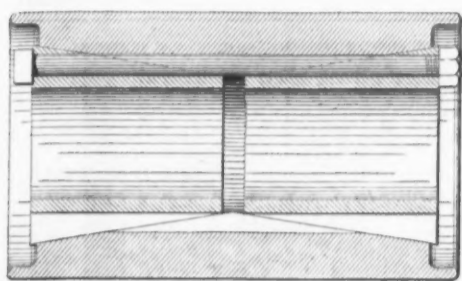


Fig. 1.—Sellers Coupling.

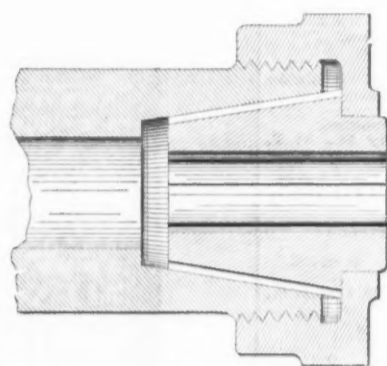


Fig. 2.—Section of Chuck for Turret Lathes.

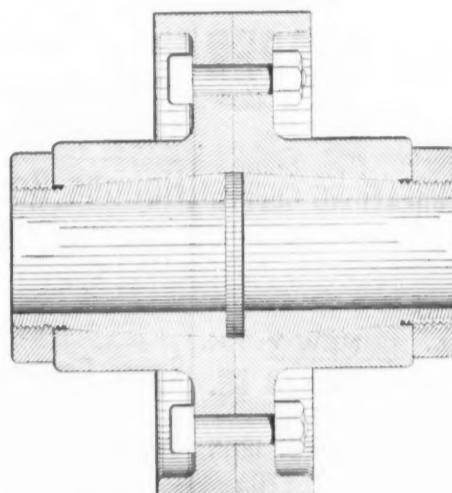


Fig. 5.—Flange Coupling with Thin Sleeve, as in Fig. 4.

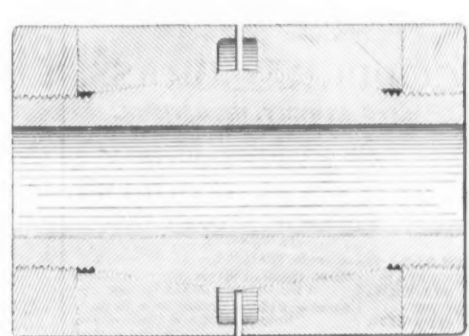


Fig. 6.—Principle of Collins Coupling.



Fig. 3.—End View of Fig. 2.

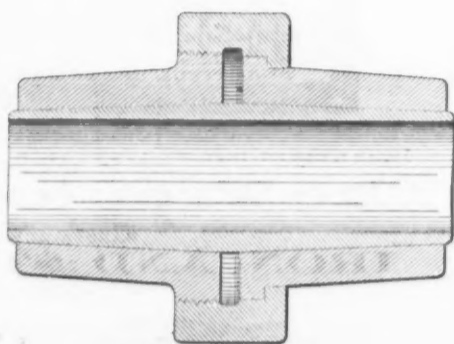


Fig. 4.—Coupling with Thin Sleeve.

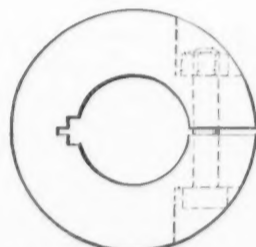


Fig. 7.—End View of Briggs Coupling.

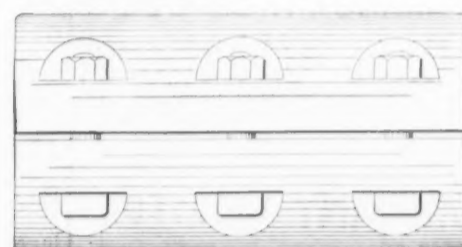


Fig. 8.—Elevation of Briggs Coupling.

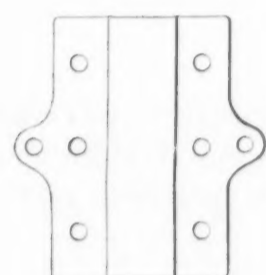


Fig. 13.—Template for Drilling Holes in Coupling Shown in Fig. 12.

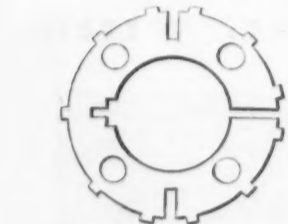


Fig. 10.—End View of Cone Bushes.

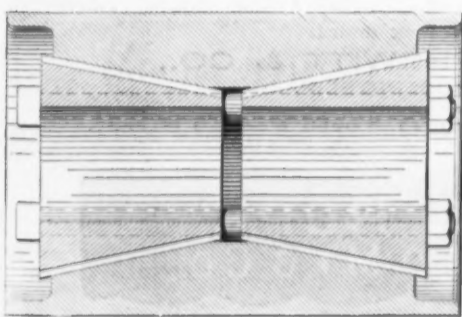


Fig. 11.—Section of Cone Bushes.

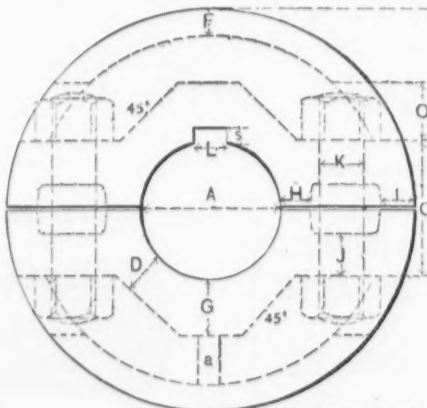


Fig. 12.—Clamp Coupling with Outer Guard Shell, Made in One Piece with Coupling Proper.

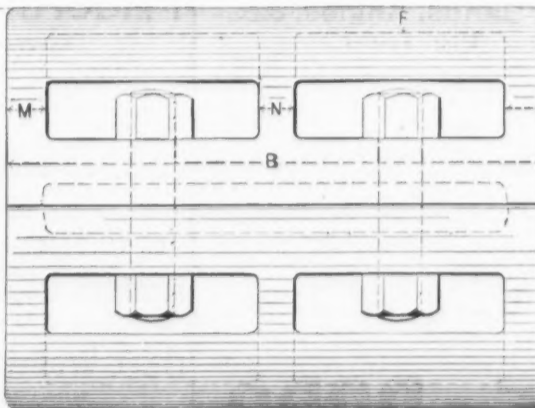


Fig. 9.—Plain Clamp Coupling.

INTERCHANGEABLE SHAFT COUPLINGS.

couplings are an exception. Of these at least one-half made at this time are special, arranged in pairs, fastened with taper keys, faced off in place and carefully marked so they will fit together, constituting the shafting to which they are applied special machinery. If a line of shafting thus provided has to be extended the end section must be taken down and fitted with a coupling. If a coupling comes loose, and they often do, there is a difficult and expensive repair job, and when repaired but little security for future performance. If a pulley is to be put on, a coupling has to be "knocked off" and when put back will likely be too loose or run out of truth. The system is a bad one in every sense, and yet not without excuses.

Progress in machinery making comes mostly from the requirements of those who use machinery. The interests of makers are opposed to change and innovation, and it is only after there is a demand for change that it is made. I do not by this remark mean that makers do not improve their machines; they are continually doing so, but nearly, if not always, fill wants developed by others and only to meet competition. The case of interchangeable couplings is in some respects an exception to this rule. It is the maker who needs this improvement. The consumer who purchases and erects shafts finds the parts he has especially to deal with interchangeable. Couplings do not concern him much, and so long as pulleys, brackets, bearings and collars are interchangeable he will not protest. The

warrant this statement. People lack confidence in the holding power of such couplings under severe strain, and not without cause. For belt transmission and when shafts are of accurate diameter they do very well; but there are other cases, many of them. There are scores of devices for adjustment, nearly all of them taking the form of conical bushes or collars to be moved endwise in their seats. There has been some desperation in the matter, no doubt because it is useless to attempt a systematic manufacture of line shafting by having couplings keyed on, matched in pairs and hand-fitted, as they must be. The expense and inconvenience of such a method is out of the question; so there has been a struggle by different makers to invent some coupling of their own, generally, as before said, involving conical fits of some kind.

The first interchangeable coupling, that of Messrs. William Sellers & Co., of Philadelphia, may be said to have exhausted the conical bush system. It combined all the good points possible in its class, and as a mechanical device has high claims on all that have succeeded it. The method of construction is shown in Fig. 1. The features before alluded to are: 1. The cones act independently on each shaft. 2. The force on each is balanced by the through bolts pulling on each cone. 3. The outer shell represents a double function, supplying the required rigidity and also the compression, thus saving weight. 4. The bolts as inserted form a complete lock between the cones and outer shell. The fault of

If a conical bush is split into several pieces and the circumference removed, except some narrow bearings, a tolerably efficient adjustment is secured, but not true enough for a shaft coupling. Fig. 2 shows a kind of chuck employed on turret lathes in England, and perhaps in this country also, that holds very well on rough rods. The end view, Fig. 3, shows how the outer bearing is reduced or cut away. Theoretically the bush fits only at one point, but the faces are so narrow that some movement is possible. In 1867 the writer attempted to make shaft couplings based upon the assumption that a "thin" sleeve would yield and close concentrically to some extent if forced into a tapering seat. Fig. 4 shows one of these couplings, the best one among several modifications. A good many of these have been made, and, like others of their class, will hold accurately turned shafts under moderate strain. Fig. 5 shows an application of these shells to flange couplings, but of no value because of cost and elaboration. Mention has been made in connection with the Sellers couplings of the outer member, or one member, performing two functions. This is an important matter, as can be illustrated by the coupling, Fig. 6, which shows the method of what is called the Collins coupling. Here it may be seen the outer member is severed at the center, so that the inner shell represents the rigidity of the shaft through the coupled joint. The outer main rings perform only compression, and the two screw collars at the end are only to drive on the main collars. Thus, it

lings of different kinds in England I visited the celebrated works of Cail & Co., at Paris, and there saw the line shafts connected with couplings such as shown in Figs. 7 and 9. They had been in use 30 years, and, it was stated, had never given any trouble. They will be recognized as the Briggs coupling, patented by Robert Briggs, of Philadelphia, about 20 years ago. They are not balanced or symmetrical, and are very inconvenient to put on or remove; otherwise they had advantages over couplings when the force of the screws had to be applied through the medium of wedges or cones. A few days later, on my return to England, and while this matter was fresh in mind, I met with an example of connecting a broken propeller shaft by means of plain embracing clamps, as shown in Fig. 9, a method familiar to every one. These two circumstances and the conclusions they gave rise to confirmed the following opinion, ever since entertained, namely, that mechanic art never has and probably never will furnish a better means of connecting shafts than by clamping shells in two or more parts drawn together by common screw bolts. The history of all the various coupling expedients points to this. The "concentricity" of adjustment is equal or better, what there is of it, and the force of the screws is direct in the line of compression. In California, 1884, the problem came up again. There was occasion to use interchangeable couplings, and in deference to common opinion and because of the want of symmetry in plain clamps I tried the cone bushes, as shown

ing shells, but this increased the cost and added details. The result was, however, to make the outer shell or guard an integral part—in other words, the metal was disposed in two concentric shells connected by diaphragms, leaving a place for the screw-nuts in the circular space between, as shown in Fig. 12, which is a true drawing of a 3-inch coupling. This distribution of the metal, removing part of it further from the neutral axis, diminished the weight, while the exterior was symmetrical and could be used as a pulley when required. The screw-bolts or studs were completely housed and could be screwed up with a common wrench. Two things were demonstrated, the couplings would "hold" and run true.

Visiting England during the past summer, I found my son, of George Richards & Co., Limited, Manchester, struggling with the interchangeable coupling problem. The company are extensive makers of pulleys and other transmitting machinery, and had exhausted, so to speak, the whole field of compression couplings. The experiments at the works to determine the merits of different couplings were simple and crucial. Shafts were connected with two bearings wide apart, and a coupling between to test true running. By slightly reducing the shafts where the couplings fitted on, the range of adjustment was soon seen. To determine strength short shafts were inserted and twisted until some part gave way. The results were discouraging. The

(Concluded on page 7.)

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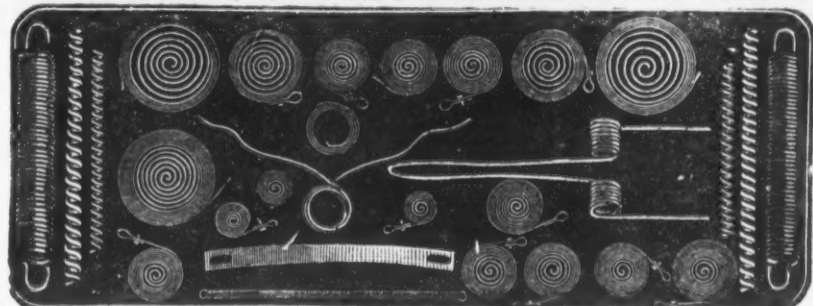
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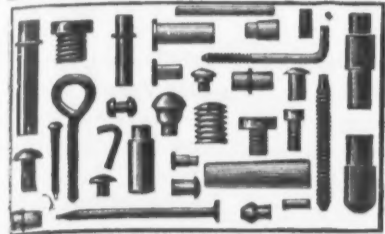
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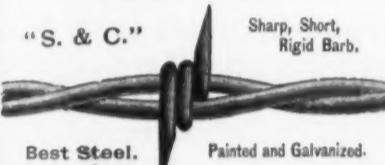
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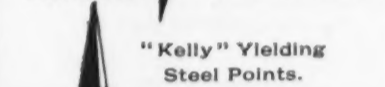
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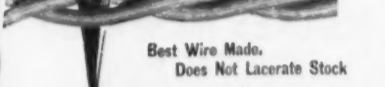
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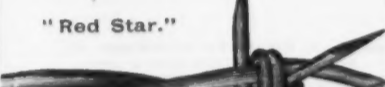
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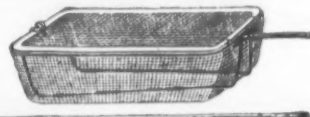
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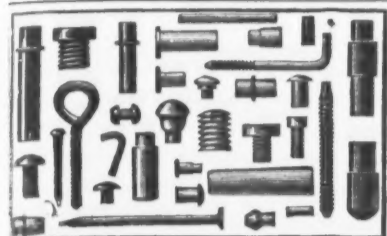
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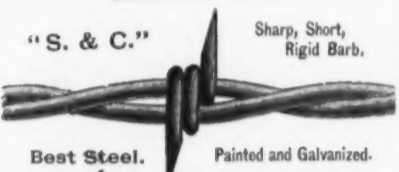
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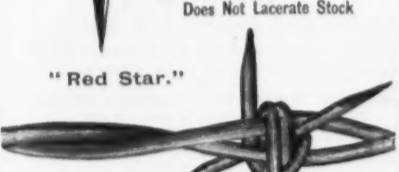


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¾, 1, 1 ½, 1 ¾, 2, 2 ½,
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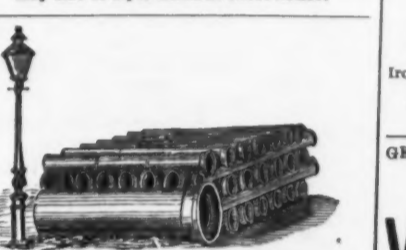
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The report of the great Belgian John Cockerill Iron Works Company, Seraing, for the year 1885-86 gives the total amount of the income as £1,324,028, against £1,472,394 in the preceding year, and the gross profit as £98,702, against £121,505 in 1884-85. The net profit, after the deduction of the depreciation account, interest and other charges, was £33,149, out of which a dividend of 50 francs per share has been declared, against 62 francs 50 cents for 1884-85. It is stated that the coal-mining department showed better results in 1885-86 than in the previous year. There was a falling off in the quantity of ore forwarded from the iron mines in Luxembourg and Belgium, and the output of pig iron from two blast furnaces was 31,704 tons in 1885-86, against 46,110 from three blast furnaces in 1884-85. The output from the rolling works was 1 per cent. less than in 1884-85, and showed very little profit. The profits of the steel works were seriously affected by the break-up of the International Rail Association, and the directors endeavored to find compensation in increased exports. The manufacture of railway tires, begun in December last, promises well; the boiler-making branch has been active, but, on the other hand, the demand for railway construction materials has tended to stagnate. Several steamers have been built by the company in the Antwerp yards for the Government account, and also for the company's own service, which now includes 11 steamers. The Spanish ore mines of the company in Somorostro are nearly exhausted, but the new Krivog-Rog mines, purchased by the company in Russia, promise to give a good return at 2.50 francs per ton, and, when a railway has been laid, at 1.90 francs. As regards the future prospects of the company, the report states that, in the present position of the industry, the shareholders must be prepared to sanction the erection in foreign countries of fully-equipped iron works capable of competing with already existing native establishments. In pursuance of this policy blast furnaces are to be erected in Ishergues and Viscaya, and another Seraing was to have been established in China, but the negotiations were interrupted by the Franco-Chinese war. A gun factory is to be erected in Morocco. The Congo Government has invited the Cockerill Company, with other Belgian companies, to tender for the delivery of rails for the Congo Railway. The company have also been commissioned to lay pipes for the conveyance of petroleum from Baku to Batoum. The contract is for £2,000,000, half of which is to be expended in Belgium for the materials, and the other half in Russia in the construction works. The chief business in hand is the erection of the Warsaw and Prague Steel Works, at Ekaterinoslaw, in which undertaking the Rhenish Steel Works Company are also concerned. On September 28 the amount of the orders on the books was £318,320, against £390,280 at the corresponding date last year.

The Solingen Iron Industry.—The trade in Solingen iron goods, says an exchange, can scarcely be called normal. Since by the peculiarity of the industry, which is largely a house industry, anybody can carry on the manufacture of scissors and knives, even with the most modest means, the number of manufacturers has grown to an enormous extent. Some of them work for Solingen, Remscheid, &c., commission houses, while others visit the German markets and by offering the lowest prices imaginable compete keenly with houses of old renown. The Solingen industry relies, however, to a great extent upon foreign countries for the sale of its products. North America, one of the best customers, has lately given large orders in pocket and pen knives. The South American States, Africa, Australia, &c., have for some time been less extensive purchasers of Solingen goods. Few new commissions come to hand in weapons. Hoes, which in consequence of the West Indian sugar crisis have long had no sale, are now being made again in small lots. There is a fair business in table knives and forks. The business in umbrella furniture has improved, and the conclusion of a convention has led to an increase in prices.

A new coke railroad is to be built under the management of Col. A. G. Hatry, of Pittsburgh. It will extend from the Pennsylvania State line, through Preston County, W. Va., to Newburg, on the line of the Baltimore and Ohio Railroad. The company own 20,000 acres of coking coal land in West Virginia, and will at once push the line through. The capital of the road is \$3,000,000—that is, \$1,000,000 in bonds and \$2,000,000 in stock. President Roberts, of the Pennsylvania Railroad, has agreed to extend the Southwest Penn Road from its present terminus at Fairchance, in Fayette County, to the State line, in Fayette County, to the State line, to connect with the new road. This extension will cost about \$800,000. Prof. J. C. White, the well-known geologist, in referring to the territory tapped by this road, says: "The land in question is located between the Baltimore and Ohio Railroad on the south, and Cheat River on the north, and embraces the principal portion of what has been termed by geologists the 'Preston coal basin.' This area, like most other great and valuable coal fields, lies in a geological trough, the western arch of which is formed by the Chestnut Ridge axis, while Laurel Hill makes the eastern boundary. There are two important coals underlying practically all of this valuable tract of land, and they are known to geologists as the Upper Freeport and Lower Kittanning beds of the Pennsylvania system. The former is a coking coal of excellent quality in this great basin, and its thickness is such as to render the area in question the most valuable tract of coking coal yet remaining open to development anywhere in the country. That this bed is a genuine coking seam is evident to every one who has seen it and who knows a coking coal's appearance; and, besides, it has been tested practically for several years in the ovens at Austin, Irondale and other points."

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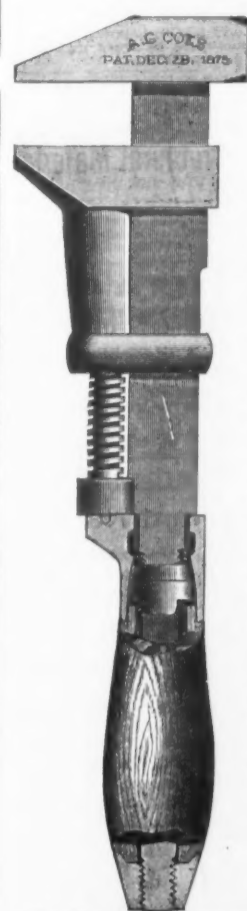
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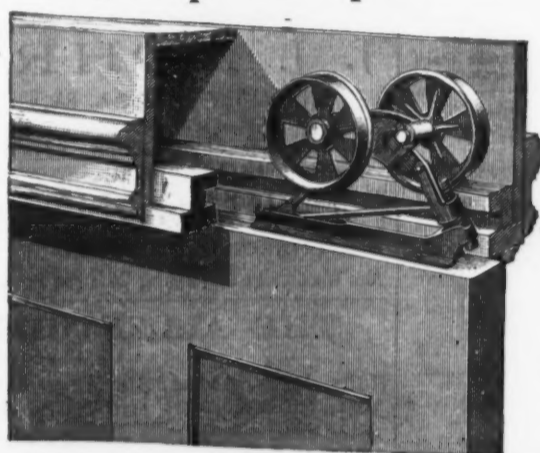
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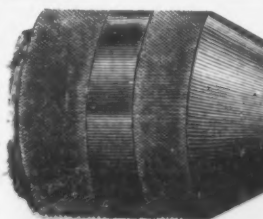


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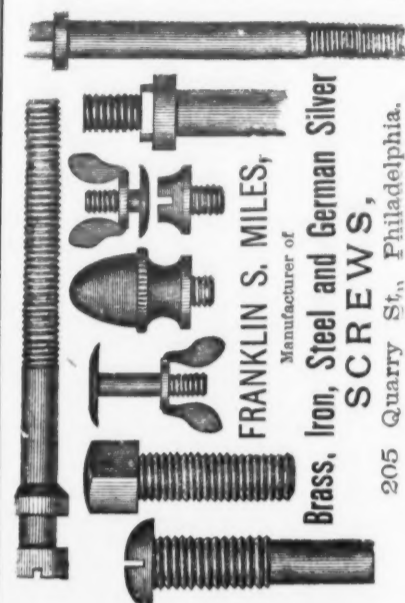
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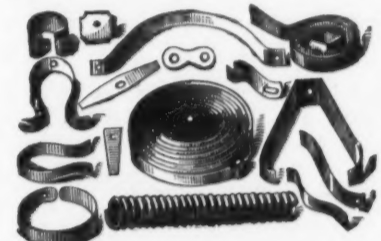
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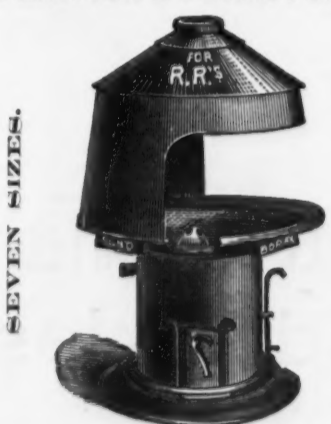
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Fig. 120.



Fig. 200.



Fig. 70.

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(Concluded from Page 1.)

shafting was mainly for millwork carrying wheel gearing, clutches, and in most cases loaded to its full torsional capacity. I recommended the couplings last described, which were soon made and tried. The result was that the plain clamp was at once adopted and christened the Grim Death coupling. In order that the amount of metal and its distribution in these couplings may be understood, Fig. 12 and the table have been prepared. The proportions are for American cast iron of good quality:

TABLE OF SIZES FOR COUPLING SHOWN IN FIG. 12.

	1 1/2	1 3/4	2	2 1/4	2 1/2	2 3/4	3	3 1/2	4
A, fin diameter.....	1 1/8	1 1/4	1 1/2	1 5/8	1 3/4	1 7/8	2	2 1/8	2 1/4
B.....	6	7	8	9	10	11	12	14	16
C.....	1 1/2	1 3/4	2	2 1/4	2 1/2	2 3/4	3	3 1/2	4
D.....	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 5/8	1 3/4
E, approximate.....	4 1/2	5 1/4	6	6 3/4	7 1/4	7 3/4	8	9 1/4	10 1/4
F.....	1 1/8	1 1/4	1 1/2	1 5/8	1 3/4	1 7/8	2	2 1/8	2 1/4
G.....	1 1/8	1 1/4	1 1/2	1 5/8	1 3/4	1 7/8	2	2 1/8	2 1/4
H.....	1 1/8	1 1/4	1 1/2	1 5/8	1 3/4	1 7/8	2	2 1/8	2 1/4
I.....	1 1/8	1 1/4	1 1/2	1 5/8	1 3/4	1 7/8	2	2 1/8	2 1/4
J.....	1 1/8	1 1/4	1 1/2	1 5/8	1 3/4	1 7/8	2	2 1/8	2 1/4
K.....	1 1/8	1 1/4	1 1/2	1 5/8	1 3/4	1 7/8	2	2 1/8	2 1/4
L.....	1 1/8	1 1/4	1 1/2	1 5/8	1 3/4	1 7/8	2	2 1/8	2 1/4
M.....	1 1/8	1 1/4	1 1/2	1 5/8	1 3/4	1 7/8	2	2 1/8	2 1/4
N.....	1 1/8	1 1/4	1 1/2	1 5/8	1 3/4	1 7/8	2	2 1/8	2 1/4
O.....	1 1/8	1 1/4	1 1/2	1 5/8	1 3/4	1 7/8	2	2 1/8	2 1/4
Number of bolts.....	4	4	4	6	6	6	6	6	6

A division can be cast in at A, Fig. 12, if preferred, for molding.

In making the coupling the faces are first dressed by grinding or planing, and the holes drilled through a template, as shown in Fig. 13. The template, if not accurate, can be turned over in drilling the two holes to secure an exact match. They are next bolted together with a thickness of paper between, bored and turned all over, then separated and the keyway planed out. The work is all done by boys, and the cost does not exceed 25 cents for each inch of bore. I may mention another convenience not at first thought of. The couplings can be applied or reversed without disturbing the shafts. This alone constitutes a considerable claim for the method. The moral, if any, to be drawn from the "history of couplings" is that in an endeavor to find out something new and ingenious we have overlooked the most simple and successful methods. This has been true of many things, and suggests a new department of study in our technological training, the art of "leaving out pieces."

Latest Legal Decisions.**INSOLVENT ASSIGNMENT.**

A creditor had his debtor sued in another State within a week after the insolvency was known to him. The debtor on the night of the day of his suspension told the creditor that a firm in New York was indebted to him, and two days later the creditor assigned his claim to a citizen of New York, who a few days later brought suit and attached the debt due the debtor by the New York firm. Two months after this, there having been in the meantime several meetings of the creditors, the insolvent made a proposition for a composition under the statute, but two weeks later it was withdrawn and regular proceedings in insolvency were prosecuted, which resulted in the appointment in 10 days of an assignee. This appointment was made before the suit in New York reached a judgment. The assignee filed a bill in equity to restrain the creditors from proceeding further with the New York suit, claiming that that was brought in his interest alone, as there was no consideration for the assignment of his claim. The case—Cunningham vs. Butler—was reserved for the opinion of the Supreme Judicial Court of Massachusetts, where an injunction was decreed. Judge Devens, in the opinion, said: "We have held in a recent case that a court of equity has jurisdiction to enjoin a citizen of this commonwealth from availing himself of an attachment of personal property in another State in an action against a debtor who is insolvent under the laws of this State, thus preventing the property from coming to the hands of the assignee, and that it is no objection that the action was commenced before the institution of the insolvency proceedings if the action was brought with the knowledge that such proceedings were about to be instituted, and with a view to obtain a preference thereby. We hold in that case that the equitable right of the assignee was paramount unless some valid claim or lien existed on the funds which, under the laws of the foreign State, would divert them from the assignee if the defendant was compelled to abandon his attachment. It is contended here that this decision was not made after a careful consideration of that provision of the Federal Constitution which declares that 'full faith and credit shall be given in each State to the public acts, records and judicial proceedings of every other State,' it being claimed that the attachment proceedings in New York were judicial proceedings under that provision, and certain cases have been cited to us in support of this view. But we do not find on an examination of these cases that they support the defendant's view, and we must hold to the opinion expressed by us. And we cannot see any injustice in holding that a State which has enacted a system for an equal distribution of the assets of an insolvent among his creditors, residents of that State, who are bound by the decree establishing the insolvency, should be restrained from seeking in other States assets which otherwise might reasonably be expected to come to the assignee."

FALSE REPRESENTATION—SALE OF PARTNERSHIP INTEREST—INABILITY OF PATENTS.

N. formed a partnership with D. to make and sell barbed fence wire, and as his contribution to the concern he put in three alleged inventions belonging to him, for one of which he had a patent, and the applications for the other two were pending. The

business was begun, and conducted successfully for six months, with N. as superintendent of the factory, when he refused to continue the business and threatened to sell his patents, he having obtained another patent for which he had an offer of \$25,000, unless D. bought them. D. made a purchase of N's interest in the firm for \$23,000. This purchase included also machinery, tools, fixtures, goods manufactured and not manufactured, stock on hand, and all debts and claims due the firm. N. represented before the sale and at the time of it that the improvements were his own invention; that

the patents were genuine, and especially that they did not infringe the patents of the Washburn & Moen Mfg. Company and of J. L. Elwood; but it turned out that his patent did infringe these patents, and that his claims were worthless. A part of the purchase money had been paid, and a suit was brought to restrain the collection of the balance and to recover the amount paid on the ground that the sale was procured by deceit. The bill was dismissed, and the case—Dillman vs. Nadelhoffer—was carried to the Supreme Court of Illinois, where the judgment was affirmed. The Chief Justice (Mulkey), in the opinion, said: "Conceding that the statement that defendant was offered \$25,000 was false, and that under some circumstances it might be a ground for equitable relief, there are a number of reasons why it cannot be so regarded in this case. In the first place the statement is too general and vague. There is nothing in it to indicate when, where or by whom it was made, or whether it was by a responsible or irresponsible person. And that N. consented to accept \$23,000 from D. when another, as he stated, was willing to pay him \$25,000, ought to have satisfied any reasonable person that the representation could not be safely relied upon. But, when the representations as to the value and validity of the patents were renewed at the time of the sale, D. had been manufacturing under them for nearly a year, and it must be presumed that he had learned about all that could be known about them, so far as their usefulness was concerned; and, as to their legality or validity, that necessarily involved a mere legal opinion, about which one non-professional person could judge as well as another."

SALE OF MACHINES—BREACH OF CONTRACT.

D. sold his washing machines to a laundry machinery company, to be delivered to the extent of 50 machines in each year for five years at \$110 each. At the end of the first year the company gave notice of the termination of the contract and D. sued for damages. In this case—Dolph vs. Troy Laundry Machine Company, brought in the United States Circuit Court for the Northern District of New York, the plaintiff had a judgment and the defendant asked for a new trial on the ground that the damages allowed were excessive. The damages allowed were the difference between the cost of making the machines and the contract price, while the defendant contended that he should be held liable only for the difference between the contract price and the market price at the time of delivery under the contract. Judge Wallace, in granting a new trial, said: "The plaintiff was given here more damages than he suffered. Damages under the rule allowing the difference between the cost and the contract price is sanctioned only where there is no other criterion for ascertaining the loss. In an important English case it was decided that, when from the nature of the article here is no market in which it can be got, the cost and the contract price fix the damages. The well-settled rule of damages for the breach of an agreement to sell and deliver personal property at a future day is the difference between the contract price and the market value of the property at the time of the delivery called for by the contract. It is quite immaterial whether the article to be delivered is or is not in existence at the time the contract is made."

The steel made by Shoenberger & Co., of Pittsburgh, by their natural-gas process, for locomotives, boilers and fire-boxes, appears to be gaining popularity rapidly. Five locomotives that are in course of construction by the Rhode Island Locomotive Works for the Cincinnati, New Orleans and Texas road will have boilers and fire-boxes of this steel; a group of engines that the Brooks Locomotive Works are building for the Illinois Central will have boilers and fire-boxes of the same material, and the Wabash and several other roads are patronizing this make of steel in a free way that indicates satisfaction with the service obtained.

We understand that the well-known German firm, Carl Schleicher & Schüll, of Düren, who handle drawing materials, are putting on the market an improved form of blue-print apparatus. It was designed by Mr. Hugo Sack, and is said to work pneumatically. The exact details, however, are unfortunately not given. Important advantages are claimed for the new arrangement.

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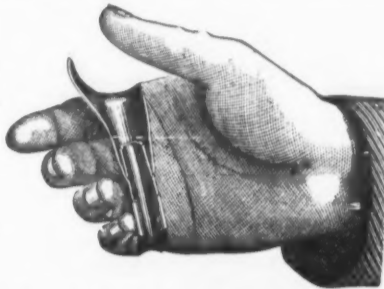
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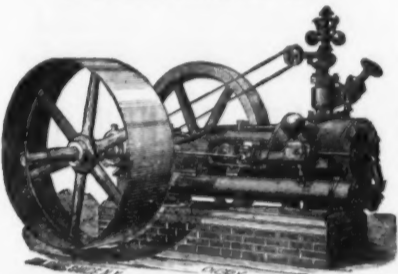
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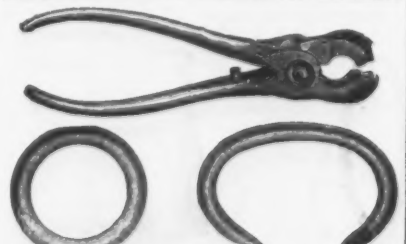
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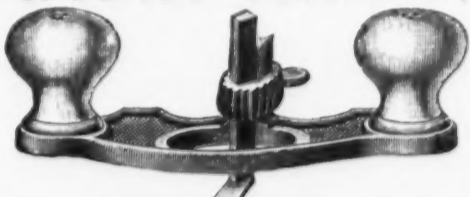
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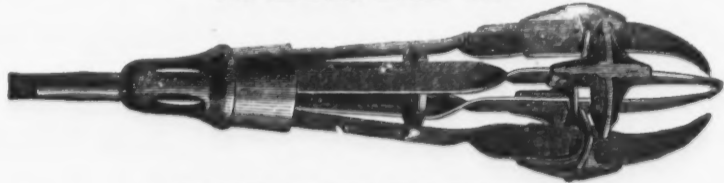
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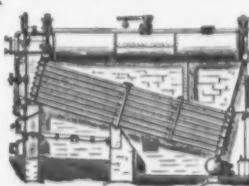
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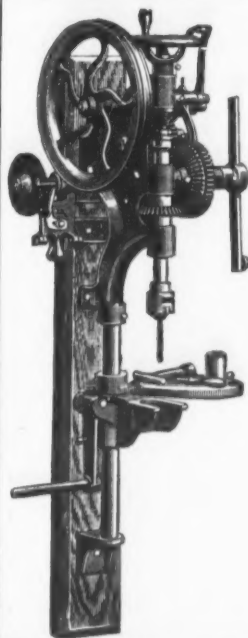
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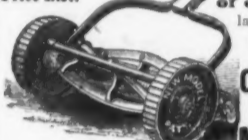
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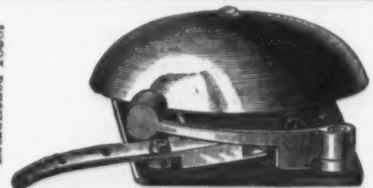
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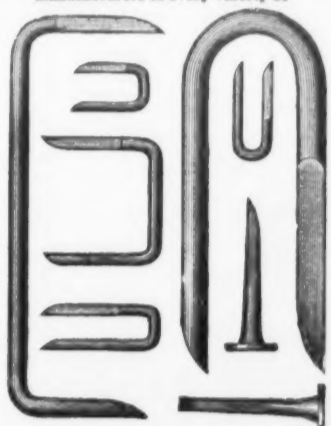


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FLORENCE TACK CO.,

P. O. BOX 30, FLORENCE, MASS.,
Manufacturers of every variety of



TACKS, SMALL NAILS, DOUBLE-POINTED TACKS and STAPLES. Our STEEL CLINCH STAPLES will drive in harder wood or mortar than when made from iron. They can also be clinched as well as any soft iron staples.

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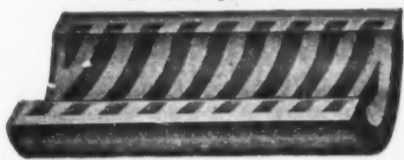
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augury for local trades. Cutlery and plating firms are tolerably busy on season orders, and the lighter trades generally are doing better.

THE WEEK.

The pork and beef packers' strike in Chicago became general on Saturday, when a general order of the Executive Committee of the Knights of Labor went into effect. Nearly 25,000 men are affected by this order, and over 14,000 have quit work. The employing packers declare war upon all labor organizations.

President Roswell P. Flower has resigned as chief of the Subway Commission.

The growth of the cotton-seed oil industry during the last six or seven years has been remarkable. In 1880 there were 40 cotton-seed oil mills in the South, employing a capital of \$3,504,500, while at present there are between 140 and 150 mills, and their capital aggregates nearly \$11,000,000. For a few years prior to and succeeding 1880 the business was very profitable, but, under the severe competition that arose when mills began to increase so rapidly, the price of cotton seed advanced while oil declined, thus cutting down profits at both ends.

According to Commissioner Koch, of the New York Dock Department, in the 16 years since its organization the total revenue of the Dock Department has been \$12,780,584 from leases and wharfage. The expenditures for the same time have been \$12,170,361. These expenditures include \$203,530 on the Inman pier, that brings in an annual revenue of \$30,000, and more than \$500,000 more for other water-front property. Last year the collections for rents and leases were \$1,556,000, and the expenses of all kinds were less than \$377,000. The engineering plans and system are examined and approved by a board of engineers that include Gen. John Newton and Q. A. Gilmore, United States Engineers, and William E. Worthen. Despite all that has been done, the lack of facilities is such that 25 new piers would be immediately occupied.

The Grand Duke Alexis frequently inspects the steel cruiser building for the Russian Government at St. Nazaire. It is said that he believes in vessels of light draft that can be handled quickly and can give a rapid fire. The French Government is also inclining toward light war ships with great speed, and there is a growing opinion among the naval men of Europe that the limit has been reached in the construction of heavy armored vessels.

The Belgian capitalists to whom the Congo State has just granted a concession for building a railroad 235 miles long around the cataract have subscribed the funds needed to send a party of engineers and specialists to survey the route, determine the cost and prepare the plans. It is expected that this work will occupy more than a year. The new syndicate assert that they have received assurances of adequate financial co-operation when the work of track-laying is ready to begin.

A great stockyard scheme is said to be in process of incubation for the extension of the export trade in cattle at the port of New York. The parties concerned are the St. Paul Union Stockyard Company and A. B. Stickey, president of the Minnesota and Northwestern Railroad Company, who have purchased a large tract on Staten Island, just above Quarantine and about a mile above the Narrows, with 1100 feet frontage on the upper bay, where it is proposed to build extensive docks, elevators and warehouses. There is an abundant depth of water at this point for the largest shipping, and the rapid-transit railway, which runs all around the island and is controlled by the Baltimore and Ohio, passes through the property. The purchase includes 200 acres about 5 miles distant from the docks, where the stock yards and feeding stables are to be located. The object of these arrangements is to avoid the charges for lighterage at New York and the embarrassments now attending the transshipment of cattle and grain.

The attempt to suppress oleomargarine in the dairy interest seems to operate rather as a stimulant. In this city, as shown by the report of the Mercantile Exchange, the exports during October of oleomargarine and kindred oils amounted to 18,787 packages, against 6970 packages exported last year, showing a monthly gain of 11,817 packages. Applications for stamps are far beyond expectations.

The Commissioner of Labor, Carroll D. Wright, who is gathering data for his forthcoming annual report, says that all the conditions affecting labor are now decidedly more favorable than a year ago. There is a very much smaller amount of unemployed labor, wages are better and a number of changes have occurred in the direction of improvement. The Commissioner has, however, concluded to restrict himself to statements supported by definite figures. He promises to give in a clear and accurate form the actual results, as shown by figures and authoritative facts, of strikes, lockouts and other labor troubles, and the effects of convict labor.

The Atlantic Works, at Boston, are to make temporary repairs on the Cunard steamship Pavonia to enable her to proceed

to Liverpool, where she will be put in her former condition. It is said that the steamship company will save \$50,000 by this plan.

Spontaneous combustion in one of Barbour's flax-spinning mills, in Paterson, caused \$15,000 damage.

A contract for building a pier 503 feet long at West Fortieth street was awarded to Richard Cronan for \$39,440. Piles 75 feet to 85 feet long and 15 inches at the butt will be bolted with 12-inch spikes. A space is reserved through which to carry the sewer-pipe under the entire length of the pier, so that it will empty into the channel.

Satisfactory results were obtained in the tests of the new 6-inch and 8-inch steel guns at Annapolis.

The factory troubles at Augusta, Ga., have been settled on the following terms: Recognition of the Knights of Labor, abolition of the pass or line system, remission of rents until November 6th, and future differences between operatives and mills to be decided by arbitration.

The supervising inspector-general of steam vessels, James A. Dumont, in his annual report shows that 5744 steamers were inspected, aggregating 1,081,748 tons burden, and 25,780 officers were licensed. This is an increase as compared with last year of 106 in the number of vessels inspected and 635 in the licenses issued, while the tonnage shows a falling off of 16,617. The receipts from inspectors were \$95,470 and from licenses \$12,890, while the expenditures aggregated \$248,722. There were 40 accidents to vessels resulting in loss of life, the fatalities exceeding by 49 the number during the preceding year.

There are but two gun foundries in the United States—one at West Point and the other at Boston. The latter can turn out guns of any size and could employ 600 or 700 men if business offered in sufficient amount, but with the present facilities the recent recommendations of the Ordnance Board, supposing that they had been sanctioned by Congress, could not have been carried out in 10 years. The crippled condition of our gun foundries is a subject for public concern.

The demand for American plate glass is so heavy that the workers are unable to keep up with it by working night and day. The new plate-glass works were recently started at Trenton.

The asbestos mines in Canada will this year put out 2000 tons. Large quantities are used in deadening walls and floors, at the same time rendering them fire-proof.

The draft of the prospectus of the proposed Pacific-Australian cable shows that the promoters contemplate asking for £2,000,000 (\$10,000,000), and expect to get a 6d. rate across the Atlantic, and 2 1/2 d. rate across Canada to Vancouver Island, and intend charging the public 4/ per word from England to Australia and the press 1/. The project is generally regarded in London as much too sanguine.

The reports of the inspectors of factories which have just been issued in Berlin show that the employees in most of the German factories work 11 hours daily, not reckoning overtime. With overtime the workmen in some districts, notably Dusseldorf, work from 36 to 48 hours at a stretch, though they are supposed to have liberty to quit after 24 working hours. The usual hours of a boilerman in Dusseldorf are 12 and often 24 hours. In Magdeburg artisans work 12 hours, in Hannover 10 and in Amsburg 11. The steelware and iron apprentices in Dusseldorf often work 16 hours daily. In the fifth glass works the men work six days unceasingly, except for two hours, when they sleep in corners of the workshop. The general impression from the reports is that there is much overwork and a bad arrangement of hours, with hideous sanitary conditions.

The California and Oregon Railroad is being pushed northward vigorously, and will cross the Klamath River at Scott's Bar. From thence it will extend up the valley of the Klamath, penetrating Eastern Oregon. The line of road thus projected will furnish for the first time railroad communication with the rest of the world to a country rich in mineral, timber and agricultural resources, 80,000 square miles in extent—an area twice as great as that embraced within the boundaries of the State of Ohio. The region possesses many rich valleys and large areas of fertile table land suitable for agriculture. Its principal streams are the Grand Ronde, Umatilla, John Day, Burnt and Powder rivers. The main and tributary valleys are very fertile, very extensive, and are inviting a large and enterprising population. The mountainous portions of Eastern Oregon are covered with pine of a very fine quality, also cedar, fir and extensive forests of maple. Excluding the Sacramento and San Joaquin valleys, Eastern Oregon contains the largest proportion of land suitable for agriculture of any equal area west of the Rocky Mountains. It will therefore contain in the early future the largest population.

The clutter on the "L" roads will be appreciably abated by several improvements in the track now being introduced. In the first place, both branches of the road will before long have steel rails over their en-

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Plantsville, Conn.,

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BEST QUALITY CARRIAGE MAKERS' HARDWARE,

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The Star Scissors and Shears,

MANUFACTURED BY

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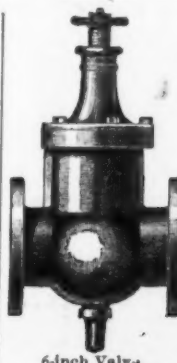
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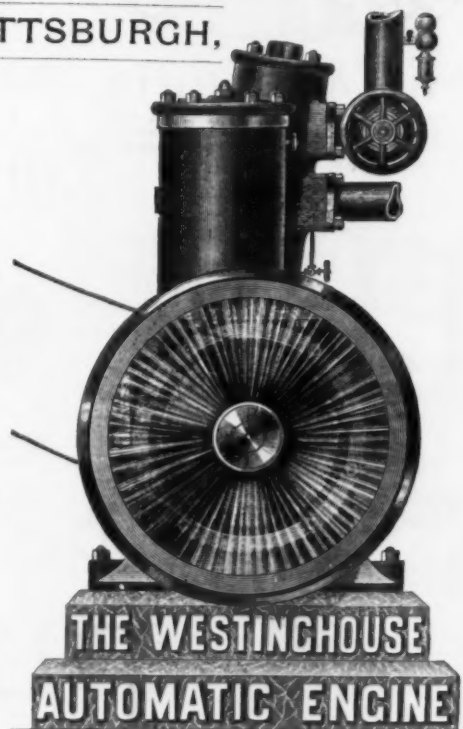
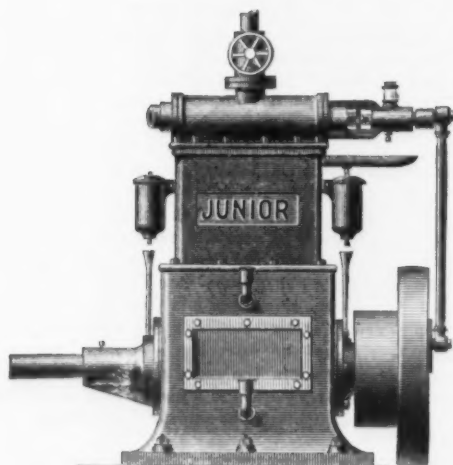
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Capital Investing for Dividends will do well to close no Contracts until our System is investigated and our Proposals considered.

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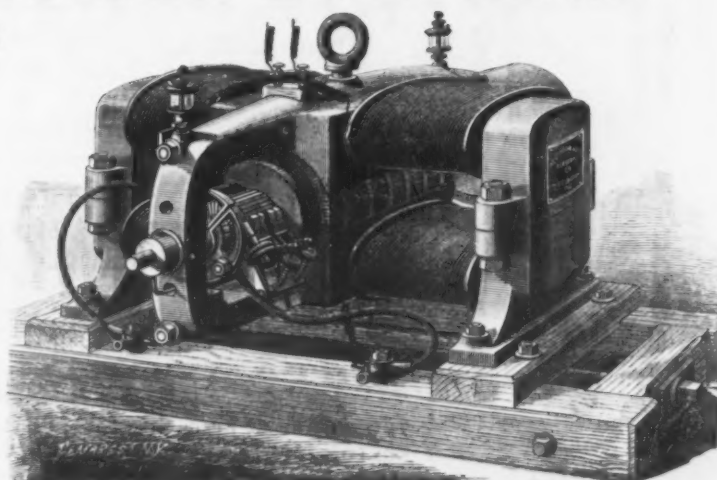
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THE OLDEST AND LARGEST MANUFACTURERS IN THE UNITED STATES OF

VULCANIZED RUBBER IN EVERY FORM ADAPTED TO MECHANICAL PURPOSES



MACHINE BELTING
WITH SMOOTH METALLIC RUBBER SURFACE.

THIS COMPANY HAS MANUFACTURED THE LARGEST BELTS MADE IN THE WORLD, FOR THE PRINCIPAL ELEVATORS AT CHICAGO, BUFFALO AND NEW YORK.

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COTTON "CABLE" HOSE, CIRCULAR WOVEN, SEAMLESS, ANTISEPTIC FOR THE USE OF STEAM AND HAND FIRE ENGINES, FORCE PUMPS, MILLS, FACTORIES, STEAMERS AND BREWERS.



CAR SPRINGS OF A SUPERIOR QUALITY

Original Solid Vulcanite Emery Wheels.

PATENT ELASTIC RUBBER BACK SQUARE PACKING.
BEST IN THE WORLD.

FOR PACKING THE PISTON RODS AND VALVE STEMS OF STEAM ENGINES AND PUMPS.



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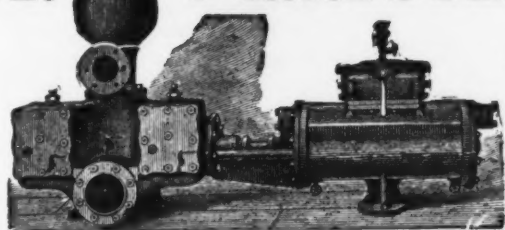
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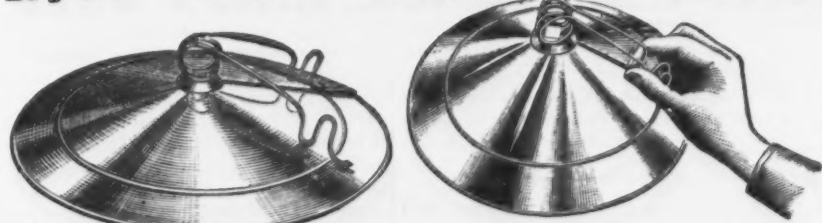
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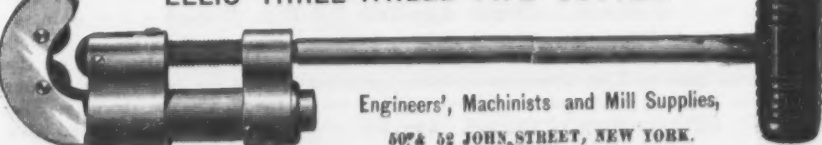
One 10 and one 12 inch cover will fit tight every sized opening from 1 to 12 inches
THE BEST SELLING ARTICLE OF TINWARE EVER OFFERED.

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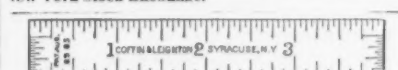
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Improved Screw Cutting
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\$60.

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Dogs, and machinists' and am-
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Agents for the Philadelphia Star Carriage and Tire Bolts.

Cline's Foot Heaters and Fuel, Patented

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Send for descriptive circular with prices.

Samuel Martin,
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Theatrical Hardware,
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tire length, and already a contract has been given to a Pennsylvania iron company for 5000 tons of steel rails, which is enough to cover 5 miles of the road. In laying these rails care will be taken to bring the ends closer together, yet not so much so as to interfere with the expansion, the effect of the new plan being to destroy both noise and jolting. Another innovation is the new Fisher joint, which consists of an iron plate resting on two ties and holding the ends of the rails securely clamped and bolted by a 1-inch bolt, thereby giving smoothness and flexibility. Another novelty lately introduced is the rail with beveled ends. Instead of being cut off at right angles to their length these new rails have their ends wrought at an angle of 45°, which makes the rail more continuous.

The advantages possessed by Mobile as a shipbuilding point are discussed by a correspondent in that city. The iron plates could be made at Birmingham. All kinds of oak and other hard woods are found on the rivers Tombigbee, Warrior, Alabama and Tallapoosa, where the Government has commenced improvements; and deep water near the Gulf, but far enough inland to be secure from long-range artillery, can be found on several large streams debouching into Mobile Bay.

The proposed West Shore feeder connecting the Albany and Susquehanna Railroad with Saugerties is expected to bring the vast coal district of Pennsylvania into more direct communication with Central New York.

Jay Gould, who recently returned from an extensive trip over the Southwestern roads, says he was received with signs of public consideration never before exhibited. The workingmen themselves—according to Mr. Gould's views—are beginning to see pretty plainly that they are being used by professional leaders. He reports unexampled prosperity all over the Southwest.

A New York architect states that he has been given orders for plans for a large number of houses which would be built this fall and winter if builders felt willing to make contracts for their erection; but what this architect calls "the labor market" forbids contractors undertaking any work that has to be finished by any fixed date.

The Morgan Steamship Line are considering the expediency of substituting iron masts for wooden ones in all their steamers, the masts to form a single piece instead of a lower mast and topmast.

The strike of molders in the Paterson foundries is at an end, more of them having applied for work than could be employed. Molding machinery has been introduced in several of the foundries since the strike began, and it is thought that at least half the strikers will have to seek work elsewhere.

The Manufacturers' Association of Philadelphia include 100 manufacturing firms in the textile trade, and employ 26,637 hands, which is somewhat less than one-third of the entire body engaged in the manufacture of textile fabrics in that city. Their weekly pay-roll is \$208,000. Should arbitration fail in the difficulties now pending, some \$150,000,000 of capital would be paralyzed and much distress ensue among the working classes.

The St. Louis Sugar Refinery, the largest in the West, was closed on Saturday night and 125 employees were discharged. The cause of closing is said to be inability to compete with Sandwich Islands raw sugar. The refinery will start up again should it prove that the new crop of Louisiana raw sugar can be purchased on terms permitting a profit.

There has been a further reduction in express rates from Chicago to New York of 25 cents per 100 pounds, so that the rate is now about the same as that for first-class freight with the expenses of cartage and delivery eliminated.

New York State decides to hold a Constitutional Convention.

John Muir, general traffic manager of the Newport News and Mississippi Valley Company, announces the establishment of a new Transatlantic steamship line between Newport News, Va., and Liverpool, England, commencing December 1. The departures will be semi-monthly.

Judge Andrews continued the injunction restraining Jacob Sharp and others from leasing the Broadway Railroad to a Philadelphia syndicate or any other parties.

While new heating apparatus was being tested in the courthouse at Lancaster, N. H., an explosion took place, as supposed from gas in the furnace, and the building took fire and burnt up.

Judge Donohue appointed a receiver for the Broadway Underground Connecting Railway Company on a judgment obtained by ex-Judge Bosworth for legal fees.

Miss Henrietta A. Lenox, who died in this city a few days ago, leaving an estate valued at from \$7,000,000 to \$10,000,000, made further provision for the Lenox Library.

Putting the wires underground in accordance with the law of June, 1885, is a heavy task. It is estimated that about 50 miles of the subway will be required to accommodate all the wires, and that the total cost of the work will not fall short of \$2,000,000. Sub-

contracts were made with James D. Crimmins for the excavation of the Sixth Avenue sections at an advance of 15 per cent. on the actual cost, and with another organization for making and laying the conduits at the rate of \$1000 a mile per duct. Each duct will accommodate about 100 wires. The Subway Company will probably charge about \$500 a year per duct. The rental of the 3 mile 24-duct conduit from Carmine street to Central Park now in process of construction will thus amount to about \$36,000 a year.

The iron steam yacht Stranger was sold on Friday by Mr. E. S. Jaffray to ex-Commodore George S. Scott, American Yacht Club, for the sum, as reported, of \$60,000.

The master's report in the Ore and Steel Company's case, on the intervening petition of the Iron Mountain Company, was filed in the Federal Court at St. Louis on the 2d inst. It finds that the sum of \$22,527 36, for ore furnished between April and June, 1884, should be allowed the Iron Mountain Company as a preferred supply claim entitled to priority over the mortgage, to be paid out of the property and earnings of the Ore and Steel Company in the receiver's hands. Suits entered against that company in various States by the Iron Mountain Company are to be dismissed upon the payment of costs.

The total customs and excise revenue of Canada for October amounted to \$2,256,067, an increase of \$233,131 over the total receipts for October, 1885.

President Goff, of the American Electric Mfg. Company, has made a free gift of the electric-light machinery for illuminating the Statue of Liberty.

Sir Edward Watkin, the well-known railway magnate, proposes the establishment of a line of Transatlantic steamers from Hull, to run in co connection with the Canadian Pacific Railway.

A six-story building in Chicago, occupied by the Goodyear Mfg. Company and other firms, was destroyed by fire on the 31st ult., and the roof and iron cornice falling killed a fireman. The total loss is estimated at \$300,000.

The issue between the textile operatives and manufacturers in Philadelphia was settled at a conference between the General Executive Board of the Knights of Labor and the Aid Committee.

The elevated railroad project in Philadelphia was defeated in the City Councils by a vote of 23 to 7, through the influence of street railway magnates.

The Lighthouse Board has no appropriation for the maintenance of lights in Liberty's torch, and it was only by a special effort that the bronze goddess was illuminated so long as the French guests remained in the city.

A new cable has replaced the old one on the Brooklyn Bridge, after being in use three years. The cable now retired from service might have lasted some time longer, but had been drawn down to about three-quarters of its original size, and had been repeatedly spliced.

The merchants of New York six months hence will have direct cable connection with the Brazilian port of Para, at the mouth of the Amazon River, also with the French cable system connecting with the West Indian colonies and French Guiana. The two lines will be operated under a single arrangement, and trade with South America, it is confidently believed will receive a strong impulse. A steam line from New Orleans to Rio direct is in contemplation.

The Hudson River tunnel may now be considered an abandoned enterprise, perhaps not so much on account of engineering difficulties as lack of funds. All the appliances used in the excavation are going into decay.

In the Austrian and Hungarian delegations on the 4th inst. Prime Minister von Tisza and Herr Smilka declared that the interests of Eastern Europe should be defended with the sword. M. Zankoff had the effrontery to demand the resignation of the Regent's Government of Bulgaria.

Completed statistics show that the year's increase in the value of German exports to America is \$17,000,000, including \$4,000,000 worth of sugar. Of the total 10 per cent. went to America.

The rate of taxation in New York this year 1 2 29 against 2 80 ten years ago, and the total tax levy \$32,421,550, against \$31,109,521 ten years ago. So it is not true that taxation grows heavier and heavier every year.

The Vessel Owners' and Captains' National Association, at a meeting held in this city last week, adopted a constitution and appointed a committee of 15, representing every State from Maine to Virginia, for the purpose of securing Congressional action in favor of the abolition of compulsory pilotage.

Immigration at Castle Garden is unexpectedly brisk for this time of the year, and for skilled labor the supply and demand are about equal. The number of arrivals is considerably larger than for the corresponding months in 1885.

M. de Lesseps, in embarking for home last Saturday, promised to return in 1889 to open the Panama Canal.

The Iron Age

AND METALLURGICAL REVIEW.

New York, Thursday, November 11, 1886.

DAVID WILLIAMS, - - - Publisher and Proprietor.
JAMES C. BAYLES, - - - Editor.
CHAS. KIRCHHOFF, Jr., - Associate Editor.
JOHN S. KING, - - - Business Manager.

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INCLUDING POSTAGE.

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Weekly Edition.....\$4.50 a year
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semi-Monthly Edition.....\$2.30 a year.
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Monthly Edition.....\$1.15 a year.
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RATES OF ADVERTISING:

ONE SQUARE (12 LINES, ONE INCH).
One Insertion.....\$2.50 One Month.....\$7.50
Three Months.....15.00 Six Months.....25.00
One Year.....40.00
PAYABLE IN ADVANCE.

BRITISH AGENCY:

Office of The Ironmonger, 42 Cannon St., London.

DAVID WILLIAMS,

PUBLISHER.

66 and 68 Duane Street, New York.
PHILADELPHIA.....230 South Fourth Street
Thos. Hobson, Manager.
PITTSBURGH.....77 Fourth Avenue
ROBERT A. WALKER, Manager.
CHICAGO.....30 and 38 Clark St., cor. Lake
J. K. HANES, Manager.
CINCINNATI.....Corner Fourth and Main Street
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Recent Improvements in the Basic Process.

In spite of the fact that the basic process has been thoroughly discussed in this country, and though successive developments have been carefully traced in *The Iron Age*, a good many erroneous ideas are still held by many in the trade. These crop out at intervals in the trade journals and in the daily press, generally, however, in the direction of overrating its possibilities. On the other hand, not a few leading ironmasters are prejudiced against it, chiefly because an early experiment was given up for financial reasons, probably affecting that particular locality alone. The unfortunate muddle into which the question of the patent ownership was allowed to drift has undoubtedly contributed largely toward retarding the development of the process in this country. This must be regretted keenly, because American metallurgists might be relied upon to work out one of its problems, that of carrying the capacity of a plant somewhat nearer our standard of output per converter in the ordinary vessel. Meanwhile very large quantities of foreign basic steel have been coming into this country, notably in the form of wire rods, billets and slabs, which have, generally speaking, met with the approval of rolling mills so far as quality was concerned. Abroad, and notably on the Continent, the growth in the steel-making capacity has taken the direction, almost exclusively, of providing additional facilities for producing soft steel from phosphoric metal. Here, aside from the works put up to supply nail mills with raw material, the new equipment has been confined to Clapp-Griffiths converters and open-hearth furnaces. It would carry us too far to trace the effects of this movement, which involves the question of the foreign basic against the domestic nail slab, the foreign basic against the domestic wire rod, and incidentally the wire nail against the cut nail, the foreign basic plate bloom against the domestic open-hearth bloom, and so on.

Technically as well as commercially the basic process has progressed very rapidly, and a number of points developed theoretically have brought about modifications of practice tending to cheapen product. There is, we believe, no more striking instance in modern metallurgy of the value of apparently purely scientific research to progress in practice than that furnished by the history of the basic process. Among the latest improvements introduced at the Hoerde Works, the pioneers of the process, is that of Professor Scheibler, who deserves a good deal of credit for the work accomplished by him in the direction of the utilization of the phosphoric acid in the basic cinder. Scheibler introduced a process in which he treated the cinder with hydrochloric acid, but the

rapid introduction of the Solvay soda process in place of the old Leblanc method made that acid, which was a by-product of the latter process, too expensive to continue work in that line. First he turned in the direction of enriching the cinder by liqation. When the slag from the basic Bessemer process is gradually cooled one part of it, richer in iron and poorer in phosphoric acid, will chill first, leaving liquid another part which is richer in phosphoric acid and poorer in iron. The idea was to return the former to the blast furnace and utilize the latter for its phosphoric acid. Now, however, he has attained the same points in a simpler manner, which at the same time presents additional advantages in the blowing of the steel itself. The different elements in the pig iron are to a large extent eliminated in succession, first silicon and manganese, then phosphorus, and finally iron is oxidized. Of course it will be understood that these reactions go on simultaneously in some degree. Professor Scheibler therefrom reached the conclusion that adding the lime in different portions instead of doing so at one time and pouring off the cinder at intervals would give him better means of obtaining separately cinder high in phosphorus. In practice it was found at Hoerde that it was best to add about two-thirds of the lime when the pig was run into the converter, and after pouring off as much of it as possible add the second lot of about one third. The following analyses show the composition of the first and second slag:

Analyses of First Slag.

Phosph. acid.	Silica.	Lime.	Magnesia.	Iron.	Prot. mang.	Sulph. calcd.
27.81	6.35	53.06	3.76	5.75	3.47	0.96
28.10	4.43	52.27	4.75	6.34	4.46	1.19
28.95	5.45	51.52	4.90	3.82	4.42	1.24
31.29	4.46	52.00	3.56	.....	.....	.....
31.50	4.56	56.88	2.54	1.80	2.06	.....
32.59	5.19	60.73	.....	2.16	.....	.....

Analyses of Second Slag.

Phosph. acid.	Silica.	Lime.	Magnesia.	Iron.	Prot. mang.	Sulph. calcd.
17.79	4.29	44.78	5.44	19.09	4.45	0.88
16.10	4.38	44.60	2.14	34.01	3.26	.....
17.36	4.68	43.49	5.81	19.75	3.85	0.71

The slags from two charges ran as follows:

	Phosph. acid.	Silica.	Iron.
First slag.....	37.65	4.89	4.50
Second slag.....	17.80	2.96	22.16
First slag.....	29.67	4.45	4.77
Second slag.....	16.08	2.74	39.65

It will be noted, therefore, that the first slag is high in phosphoric acid and low in iron, while the second is low in the former and high in the latter constituent. The first is a far more valuable fertilizer than the run of basic cinders, and the second may be profitably used in the blast furnaces for recovering the iron and introducing the phosphorus into the pig. This is likely to become an important matter in Westphalia, where the old puddle cinder which has been drawn upon as a source of supply of phosphorus is being exhausted. These in themselves are important advantages which probably overbalance the drawback due to extra handling and delays. But Professor Scheibler claims a number of other points, some of which at least he substantiates. First, the quantity of lime to be used as a basic addition is reduced from 18 per cent., which was the former average, to about 12 per cent. Then the time of blowing is shortened because the chemical reactions go on more rapidly, reducing slightly the waste and giving a hotter steel, which in turn allows of the use of larger quantities of scrap and admits of carrying the phosphorus lower. On the latter point, the evidence of other basic works is that while it is a comparatively easy matter to bring phosphorus below 0.10 per cent. it is difficult to carry it below 0.03. At Hoerde, since the introduction of the new method, it has been reduced as low as 0.015 per cent. It is stated that a saving of some importance has been realized, and it is likely that when the question of the value of the slag as a fertilizer is more thoroughly understood, and is better backed by results from more extended experience with it, the value of the innovation can be more closely realized.

The active part taken by organized labor during the recent election in defeating some Congressional candidates of well-known free-trade proclivities, and reducing the majority of others to so small a figure as to make their election dependent upon a full and final count, including all the back districts, is certainly very significant. Mr. Morrison and Mr. Hurd are conspicuous among those who have learned from experience that the workingmen are not in sympathy with their efforts to break down the tariff. Mr. Carlisle and Mr. Springer have also been reminded that the way of the free trader is surrounded by dangers of the kind which the politician prefers to avoid when he can. The influence of organized labor is so well distributed that very few Members of Congress can afford to be indifferent to its determination to save protection to domestic industry. This will tend to make tariff tinkering unpopular in Congress for the next two years at least. Under the acknowledged leadership of Mr. Randall, the Democratic party will probably make an effort to outlive its traditional reputation as the party of free trade, and bring itself more into sympathy with public opinion on this great issue. There is really no reason why this should be a party question at all. The Democrats will make a mistake if they allow it to become so. It is impossible to hinder its being in some sense a sectional issue, we presume, but as a national issue it is bound to be a milestone around the neck of the party which assumes it.

British Criticism on American Marine Engines.

It is more than curious that English engineers are so ready to find fault with and to offer advice in machinery matters that are not English, while their own designs often fail, very strikingly, to show that in them they have turned their knowledge to good account. American methods and forms of construction seem to be particularly fascinating to English critics, and American builders are therefore in receipt of more than the usual share of attention. Thus, referring to the first of the recent trials of the United States cruiser Atlanta, which, it may be remembered, did not satisfy all expectations, though the results were by no means poor as we have known English war-ship trials to have given them, the London *Engineer* expresses surprise "that Americans are not able to build a marine engine which will work satisfactorily."

To those who are acquainted even very superficially with what American engineers have accomplished in marine engineering the ludicrous position in which the *Engineer* has thus put itself is immediately apparent. We cannot believe, however, that our contemporary is so completely in ignorance of American marine-engine records as to have made this statement in good faith, but rather incline to the opinion that it has willfully mistaken the products of the Navy Department as typical of the American-built marine engine. Obviously we may with equal propriety regard a set of man-of-war engines evolved by the British Admiralty as representative types of the British marine engine, and could then establish comparisons of which English builders would have every reason to be thoroughly ashamed. Nobody, however, has yet thought of attempting to crowd out of sight the admirable work of English commercial marine engines by the admittedly miserable performances of the engines in the English Navy, and it is but reasonable when reviewing the work of the United States or of any other country to accord it the same fair consideration.

What the worth of a British marine engine would be if we accepted as a fair representation an average specimen of British war-ship engine is best told by the *Engineer* itself in its issue of August 20, 1886, where, in an article on "Marine Engines in the British Navy," it says: "But there is not a set of propelling machinery in any modern man-of-war which has been worked up to its full power for even a single week together. Can any of our dockyard readers name a vessel, not a troop ship, which has steamed at full speed for a distance of even 100 miles? * * * As to the forced draft on which so much is made to depend, has a run exceeding six hours ever been made with forced draft? How many runs of even four hours have been made without a break-down of some kind? Has not one of the latest additions to the navy come recently to utter grief in the engine-room? Are the Admiralty prepared to send a man-of-war for a trip across the Atlantic, with instructions to get across as fast as it is in the power of steam to take her? Of course not. * * * No one save the dockyard authorities and the contractors is ever allowed on board during a trial, if indeed we except the representative of one non-technical journal, presumably not an engineer, and with his mouth sealed by the very nature of the conditions under which he is permitted to be on board. Of the success achieved we hear freely enough; of the failures we never hear unless they result in so serious a break-down that absolute silence becomes impossible." In a later issue (August 27) the *Engineer* writes: "There is evidence that the machinery of her Majesty's ships constantly gives trouble, and that in many cases it is only after repeated attempts that ships can be made, so to speak, to drag through full-speed trials, all concerned knowing that, once through the test, they will not be submitted to another like it for years, if ever. * * * The makers take their chances that the ships will pull through their six hours' trial."

A few weeks later, referring to the only three hours' trial of the barbed cruiser *Impérieuse*, our contemporary says: "It will be seen that the full power trial only lasted three hours. Even the ordinary six hours was not attempted. Why? From all this we leave our readers to draw their own conclusions."

Chief Arthur, of the locomotive engineers, is gaining a reputation for epigrammatic utterances which embody a great deal of truth in few words. He lately said: "There is no antagonism between capital and labor, but there is antagonism between work and idleness." This is quite true, but it does not cover the whole ground. There is an antagonism of labor with labor, which accounts for 90 per cent. of the troubles assumed to be incidents of the contest of labor with capital. Capital suffers more or less serious injury in this conflict, but chiefly because it is forced to stand between those who are doing the quarreling. The Brotherhood of Locomotive Engineers seems to have gained its present position of controlling influence without the use of clubs or shotguns, and has recruited its large and loyal membership by offering eligible men more advantages in becoming members than they could secure by remaining out. We are not aware that there is any quarrel

between this well-managed union and the capital represented in railroads, nor with labor employed on railroads. It seems to be a great conservative force, and its influence has been exerted in right directions. It shows that a labor organization can be, but owes its superiority, we think, largely to the fact that it has better material out of which to build a membership than can be gathered in other trades. Men fit to be trusted with the grave and delicate responsibilities of train running are men capable of an unusual degree of self-control. They are trained to strict obedience, but are compelled to exercise a prompt and intelligent discretion where orders do not meet the emergency of the moment. Out of such material it is possible to build an order which shall be subject to the restricting influence of an intelligent and conservative chief. The trouble with most labor organizations is that they are composed largely of undisciplined, ignorant, impulsive men, who can imagine no other use for the power of organization than to inflict injury upon somebody. They are like boys with deadly weapons. M. Goudin has expressed his regret that his great philanthropic experiment at Guise was made with such unpromising material. Many a leader of the labor movement who has assumed responsibility with a high sense of the obligation it entails has had occasion to deplore the unfitness of the average wage-earner for self-improvement through the agencies which it is sought to provide by organization.

Imports of Iron and Steel for the First Nine Months.

Our import statistics continue to reflect the heavy increase in our purchases of foreign iron and steel, larger figures being returned in almost every item in the following list, which gives in gross tons the imports for the first nine months of the current calendar year and that of 1885:

Imports of Iron and Steel, Nine Months Calendar Years.		Quantities.	
		Gross tons.	
		1886.	1885.
Articles.			
Iron ore.....	769,196	336,488	
Pig iron.....	292,179	104,524	
Scrap iron and old rails.....	58,308	9,971	
Scrap steel.....	4,699	1,354	
Bar iron.....	30,223	21,068	
Iron rails.....	17,425	6	
Steel rails.....	9,817	14,469	
Cotton ties.....	114	92	
Hoop, band and scroll iron.....	2,557	924	
Steel hoops, bands, strips and plates.....	78,387	16,899	
Steel ingots, blooms, billets, bars and slabs.....	3,801	3,700	
Sheet plate and taggers iron.....	306,459	177,813	
Tin plates.....	114,194	61,231	
Wire rods.....	1,971	1,764	
Wire and wire rope.....	736	467	
Anvils, axles and forgings.....	437	408	

We have repeatedly pointed out that, after all, import statistics, even if brought closer to date than those of the Treasury Department, possess merely a historical value. The business has been done months before in all but those cases where the purchases were made on speculation on this side which have not yet found their way into consumers' hands. With the exception of a few articles, among them old rails, importers have sold long previous to arrival. Contracts are generally made far in advance, consumers covering their sales of manufactured goods by buying raw materials. Thus sales of spiegeleisen, Bessemer pig, blooms, slabs, billets and wire rods have already been made to a considerable extent for 1887 delivery. From the volume of this business, which can at least be approximately ascertained, it is certain that imports are likely to go on at the present heavy rate, if, in fact, they do not increase. Until lately, with the exception of rails, the principal reason for the large imports has been that prices have been exceptionally low abroad. It cannot be said that we must have the foreign material because we could not supply our home demand from domestic works. Now the tendency seems to be toward forcing us to buy them because we cannot cover our own requirements. In some articles, too, the advance of prices here may bring about more extensive buying of foreign material. This may become the case in bar iron, for instance, the bulk of which is taken by New England.

Among the most striking figures in the table is the heavy increase in old material, which has taken a fresh impetus through the higher prices here. Ingots, blooms and billets, too, are notable for the heavy increase, and it is likely that the next few months will witness a continuance of the large imports. Wire rods exhibit a surprising total in view of the fact that new American rod mills have come into the domestic market. The only article which still shows a satisfactory reduction in the quantities of foreign material placed is cotton ties.

We have before us some figures, results of a recent engine test, which cannot fail to prove of the greatest interest to all engine users, showing, as they do, a remarkably economical performance of a single slide-valve non-variable expansion engine. Regulation was effected by a throttling governor, and the general conditions were therefore such as to lend very little encouragement to expectations of unusually good results. The engines under trial were two Porter-Hamilton engines, 10 inches diameter and 15 inches stroke, running at 320 revolutions per minute, and supplying power to four 45-light Thompson-Houston dynamos at the works of the Mahoning Electric Light Company, of Chicago. The

lights were rated at 2000 candle-power each, and as such, under fair conditions, may be counted on as requiring about 1 horse-power each. The record, which we find in the *American Engineer*, is as follows: "Thirty-five lights from 4.45 to 11.30; 140 lights from 5.45 to 2 a. m.

35 x 6.75 = 236.25
140 x 8.35 = 1,155.00

Hours run for one lamp.....1,361.25

Six thousand pounds of nut coal were used, or 4 1/4 pounds per lamp per hour. No allowance was made for leakage, condensation, entrained water in steam or impurities in coal, the record being simply one made under every-day working conditions." We have no means of knowing whether precautions were taken to avoid ordinary errors of measurement, which are made much more easily than is generally supposed, and which might have influenced the figures very appreciably. Aside from this, however, there is no reason that we know of why the correctness of the results should be questioned, and as given in the above record they reflect great credit on the builders of the engines. The data, it must be admitted, are of a somewhat general character, but even if reduced to an exact basis the figures, we think, might very favorably bear comparison with those of some automatic engines now on the market.

The Condition of the Blast Furnaces in the United States, November 1.

During the month of October the pig-iron markets have gained greatly in strength, and notably in the West large sales were made for forward delivery, in many cases far into 1887. The result of the improvement since summer has been to further stimulate production, and the returns for the 1st of the current month, which we print below, reflect this in further additions to capacity.

The status of the anthracite furnaces on the 1st of November was as follows:

Anthracite Furnaces in Blast November 1.

Location of furnaces.	Total number of stacks.	Number reported in blast.	Capacity per week.	Number reported out of blast.	Capacity per week.
New York.....	30	13	3,638	17	5,007
New Jersey.....	15	6	2,447	9	1,415
Pennsylvania.....	8	3	225	5	0
Lehigh Valley.....	47	37	12,088	10	2,542
Spielgeil.....	1	0	0	1	0
Schuylkill Valley.....	44	21	7,098	23	4,244
U. Susquehanna Val.....	21	10	2,367	11	2,677
L. Susquehanna Val.....	36	24	8,161	12	2,280
Maryland.....	4	2	449	2	135
Total.....	201	116	36,348	85	18,344

As compared with former months we have:

Date.	Furnaces in blast.	Capacity per week.
November 1.....	116	36,348
October 1.....	114	35,819
September 1.....	112	33,307
August 1.....	120	36,841
July 1.....	117	36,782
June 1.....	121	38,229
May 1.....	119	36,924

In New York there have not been any striking changes. Cold Spring Furnace has been purchased by the Hudson River Ore and Iron Company, and will be blown in at an early date. One of the Crown Point furnaces will, it is reported to us, go into operation in December. In New Jersey the Secaucus went out for repairs on the 10th of October, but will resume work as soon as possible. The Spiegel furnace of the Passaic Zinc Company, which blew in some time since, is doing excellent work. In the Schuylkill Valley district the Anvil Furnace has blown out for repairs, and one of the Henry Clay furnaces was about to do so in the beginning of the month. Norway went out on the 30th ult. for the same reason. Lucinda, which started to make spiegeleisen, was about to give up its manufacture, when an accident took place, putting it out. On the other hand, Mount Laurel blew in, and Robeson, the largest furnace in the district, lighted its fires on the last day of October, which will keep the producing capacity high. William Penn Furnace, long idle, is getting ready for work; Norristown, leased to Reading parties, is soon to go on Bessemer pig; Minersville will probably be operated shortly under lease, and Swede will probably be put into repair and run early in 1887 under lease. Thus this district is beginning to experience quite a revival. In the Lehigh Valley there has been little change. One of the furnaces of the Thomas Iron Company went into blast during the month, and the only one now idle will probably resume during the current month. This same is true of the Macungie. The Lehigh Zinc and Iron Company's spiegel furnace is being rebuilt, the plan being to enlarge it considerably. The Crane Company made a heavy output in October. In the Upper Susquehanna Valley the Bloom furnace is getting ready to blow in after having remodeled the plant to increase its capacity. No. 2 Glammorgan was blown in on the 27th of October and will therefore add its full output to November makes. The fifth furnace of the Lackawanna Company, which is now out, is being repaired and will then resume. In the Lower Susquehanna region the Chestnut Hill Iron Company will blow in their remodeled No. 3 Furnace by the middle of this month. The Pennsylvania Steel Company have just blown in their fifth furnace, and one of the St. Charles stacks may have resumed by the time we go to press. All the

indications are therefore in favor of moderate increase in the make of anthracite pig iron during November.

The following is the status of the bituminous and coke furnaces:

Bituminous or Coke Furnaces in Blast
November 1, 1886.

Location of furnaces.	Total number of stacks.	Number reported in blast.	Capacity per week.	Number reported out of blast.	Capacity per week.
Pennsylvania:	17	16	16,300	1	500
Pittsburgh:	1	1	1,000	0	0
Allegheny Valley:	16	15	15,300	1	115
Shenango Valley:	21	14	7,007	7	3,012
Youghiogheny Valley:	6	6	773	4	1,175
Juniata & Conemaugh:	30	15	4,962	8	2,179
Speigels:	1	1	250	0	0
Maryland:	1	1	120	1	90
Virginia:	10	8	3,373	3	1,085
West Virginia:	6	6	2,022	1	300
Ohio:	15	11	6,433	4	2,255
Mahoning Valley:	15	11	6,433	4	2,255
Hocking Valley:	15	11	6,433	4	2,255
Hanging Rock:	12	10	2,430	2	350
Miscellaneous:	18	15	8,067	3	1,104
Kentucky:	3	3	815	0	0
Tennessee:	9	9	2,411	0	0
Georgia:	11	11	3,944	0	0
Alabama:	11	11	3,944	0	0
Indiana:	11	11	3,944	0	0
Illinois:	16	11	10,158	5	1,750
Michigan:	2	2	951	0	1,973
Missouri:	3	3	675	0	850
Wisconsin:	1	1	600	0	0
Colorado:	1	1	675	0	0
Total Nov. 1, 1886:	301	140	73,013	64	20,137

As compared with former months we have:

	Furnaces in blast.	Capacity per week.
November 1, 1886:	140	73,013
October 1, 1886:	136	70,802
September 1, 1886:	135	69,206
August 1, 1886:	133	68,552
July 1, 1886:	132	71,316
June 1, 1886:	129	70,706
May 1, 1886:	129	67,888

It will be noted that again there has been an increase in the capacity of the bituminous coal and coke furnaces blowing, and this through the accession of new plants or of works long idle. The number of furnaces coming in and going out after relining or to make repairs balances fairly well, so that there is a net gain. With the certainty that the large current production is well taken care of the point may soon be reached when the list of the furnaces long out of blast will be carefully scanned for available capacity. In the Pittsburgh district the new Edgar Thomson Furnace blew in during the month, and the stack of Messrs. Jones & Laughlins is expected soon to be added to the already enormous equipment of Pittsburgh. In the Shenango Valley, which has produced heavily during the month, the Fannie has gone out, but it is reported that the second Stewart furnace will resume work during the month. In the Youghiogheny Valley the Charlotte blew out on the 21st ult. for repairs to its hot blast. The Oliphant, however, blew in a day or two after the opening of the month, so that the output will be fairly maintained. There have been no changes of any consequence in the Juniata and Conemaugh Valleys.

In Virginia the second Longdale furnace was lighted on the 15th ult. It is stated that the Low Moor contemplated putting up a second stack. The October output of the State has been heavy, and it is probable that of November may be larger still. West Virginia and Kentucky show no changes. In the Mahoning Valley, Ohio, a heavy increase has taken place. The Mary blew in on the 26th with a capacity increased by 10 per cent., and the Falcon and Haselton furnaces were also added to the list of furnaces again running. Full activity among the bituminous furnaces of the Hanging Rock region continues, and from there, as from nearly every quarter of the country, come to us statements concerning small stocks and sales covering capacity for varying periods to come. In the Hocking Valley the Akron has gone out of blast, leaving only five out of 13 blowing.

In Tennessee the Citico Furnace has run about 24 days, one of the South Pittsburgh furnaces full time and the other two-thirds, one of the Rockwood furnaces full time and the other about 18 days and the Chattanooga full time. The Sewanee is out relining. In Georgia the Rising Fawn has made a large output. In Alabama the only change worth noting is the blowing out of one of the Alice furnaces. In Indiana the Vigo has again resumed work. In Illinois one of the furnaces of the North Chicago Rolling Mill Company, which has been making such a splendid record, went out of blast on the 15th, but, on the other hand, Joliet and Union have continued full work, and the Calumet Furnace has added its large quota to the make. In the other States enumerated there are no changes to note.

There has been a falling off, probably temporarily, in the production of charcoal iron. In Connecticut the Kent Furnace resumed work in October. In New York the Plattsburgh is preparing for a blast which will probably begin on the 20th. In Pennsylvania the Eagle Furnace went in early in October, but, on the other hand, the Hecla went out on the 30th to put in a new hearth and make some repairs preparatory to running during the entire winter. Mont Alto went out of blast on the 22d, and the make of Pine Grove in October was lessened by a two weeks' stoppage. In Virginia quite a number of furnaces blew out, among them Cedar Run, Eagle, Pierce, Raven Cliff and Walton. The latter is repairing, and will be again doing active work. On the other hand, the Reed Island and Speedwell

furnaces went in during October. In Tennessee the Aetna goes in on the 15th of this month.

In the Hanging Rock region, Ohio, there is a good deal of activity, the output for October being close up to 2000 tons. Pine Grove and Mt. Vernon went in toward the end of the month, thus making a heavier product likely in November. Stocks continue very light.

In Michigan the Spring Lake Furnace went out on the 16th, to put in a new hearth and lining. It is expected to resume in the middle of the month. The October product was somewhat light, being estimated at 14,885 gross tons.

The following is the status of the charcoal furnaces:

Charcoal Furnaces of the United States,
November 1, 1886.

Location of furnaces.	Total number of furnaces.	Number reported in blast.	Capacity per week.	Number reported out of blast.	Capacity per week.
New England:	14	7	601	7	506
New York:	9	3	367	6	382
Pennsylvania:	23	5	362	18	550
Maryland:	13	1	100	12	822
Virginia:	33	5	250	18	944
North Carolina:	2	1	130	1	150
West Virginia:	3	0	0	3	165
Ohio:	17	9	740	8	360
Kentucky:	3	2	305	1	110
Tennessee:	2	0	490	2	145
Georgia:	10	7	1,485	3	350
Alabama:	25	12	3,394	13	2,002
Michigan:	11	3	552	8	725
Minnesota:	1	0	1	1	680
Missouri:	1	0	195	1	210
Texas:	1	0	1	1	110
California:	1	0	0	1	345
Washington Territory:	1	0	0	1	175
Oregon:	1	0	0	1	100
Total, Nov. 1, 1886:	173	60	9,231	113	9,607

As compared with former months this is:

	Furnaces in blast.	Capacity per week.
November 1, 1886:	60	9,231
October 1, 1886:	68	10,232
September 1, 1886:	68	10,232
August 1, 1886:	63	9,735
July 1, 1886:	61	9,885
June 1, 1886:	61	9,867
May 1, 1886:	45	8,211

Turning now to product we have the following figures. We estimate the actual product for 10 months of the current year as follows:

Production of Anthracite Pig Iron, 10 Months, Gross Tons.

Pennsylvania:	485,324
Lehigh Valley:	364,343
Schuylkill Valley:	118,826
Upper Susquehanna Valley:	118,826
Lower Susquehanna Valley:	355,318
New York:	169,155
New Jersey:	111,982
Total, Pa., N. Y. and N. J.:	1,502,548

This does not include some of the Spiegel product of the last few months. The make of bituminous and coke iron in the leading States was as follows, in gross tons:

Production of Bituminous and Coke Pig Iron, 10 Months.

Pennsylvania:	1,121,172
Allegheny Valley:	112,394
Shenango Valley:	36,025
Allegheny Valley:	156,510
West Virginia:	73,047
Kentucky:	30,350
Tennessee:	121,195
Ohio:	655,960
Illinois:	348,565
Missouri:	87,189
Total:	3,702,909

Last year the entire product of anthracite pig was only 1,289,634 gross tons, and at the present rate of production we will make a little more anthracite pig iron than in the heaviest year since 1880, which was in 1882, when the total reached 1,823,338 gross tons. In the table of coke pig production given above, Maryland, Indiana, Colorado and Wisconsin are not included, which made 23,985 net tons of iron in 1885. For the entire year 1885 the States enumerated turned out 2,367,545 gross tons, against 2,702,909 gross tons for 10 months in 1886. This indicates a product for 1886 of close on 3,000,000 tons of coke pig, an increase of, roughly, 600,000 gross tons over last year.

Obituary.

E. K. Manville, of Waterbury, Conn., a prominent manufacturer of machinery and an inventor of extraordinary ability, died on Monday.

Mr. James Peel, for many years prominently connected with the manufacture of machinery in Paterson, N. J., died on Saturday at his residence. He was born in Yorkshire, England, in 1817, and in 1832 entered into the manufacture of woollen fabrics in Paterson. Subsequently he and a number of others formed the Machinists' Association, which during the years of their existence have manufactured many thousands of dollars' worth of all kinds of machinery. Of the eight men who started this association only one is left now.

Mr. Seth Wilmarth, one of the best known of American machinists, died 5th inst. at his residence at Malden, Mass., of heart disease, at the age of 70 years. He was born in Brattleboro, Vt., on September 8, 1810, and after passing his boyhood days at home entered upon an apprenticeship in a machine shop in Pawtucket, R. I. In 1835 he was appointed superintendent and master mechanic of the Charlestown Navy-Yard. During his long term of service—over 20 years—he made many permanent and valuable improvements in several departments of the navy-yard. He has taken out over 20 valuable patents, among which is the hydraulic lift for lifting and revolving turbines. The United States Government paid him \$50,000 for this machine alone.

WASHINGTON NEWS.

(From Our Regular Correspondent.)

WASHINGTON, D. C., November 9, 1886.

The late elections in the Congressional districts were a series of surprises on both sides. Democratic losses and Republican gains turned up where least expected. Colorado and Minnesota, hitherto counted as unwavering Republican States, reversed the political control of their delegations in Congress from Republican to Democratic. Indiana, Michigan, Ohio and Virginia went over from Democratic to Republican control. Illinois and New York, from a tie as between parties, went over largely to the Republicans, while Connecticut, also a tie, went over to the Democrats. New Hampshire, which had a solid Republican delegation, became a tie. The relative aggregate strength of parties in the present House of Representatives is: Democrats, 183; Republicans, 142. In the Fifth or next Congress parties will stand: Democrats, 173; Republicans, 152, as follows by States:

States.	D.	R.	States.	D.	R.
Alabama:	0	0	Missouri:	12	2
Arkansas:	5	0	Nebraska:	1	2
California:	12	4	Nevada:	0	1
Colorado:	1	0	N. Hampshire:	1	1
Connecticut:	3	1	New Jersey:	2	5
Delaware:	1	0	New York:	15	19
Florida:	2	0	N. Carolina:	7	2
Georgia:	10	0	Ohio:	7	14
Illinois:	6	14	Oregon:	0	1
Indiana:	6	7	Pennsylvania:	8	20
Iowa:	2	9	Rhode Island:	0	1
Kansas:	0	7	S. Carolina:	7	0
Kentucky:	8	3	Tennessee:	8	2
Louisiana:	6	0	Texas:	11	0
Maine:	0	4	Vermont:	0	2
Maryland:	5	1	Virginia:	4	6
Massachusetts:	4	8	W. Virginia:	3	1
Michigan:	5	6	Wisconsin:	2	7
Minnesota:	3	2			
Mississippi:	7	0	Total:	173	152

The Democratic majority, therefore, has fallen from 42 to 21. The Republicans who voted with the free-trade Democrats on the introduction of the Morrison bill are retired to private life, while many free-trade Democrats share the same fate. The results of the votes in the districts of Messrs. Carlisle, Morrison and Hurd, where the issue of free trade as against protection was practically the sole point of contention, demonstrate that those gentlemen did not clearly understand the sentiment of their constituents. A fall from 6000 in 1884 to 600 in 1886 in Mr. Carlisle's district, and the causes which led to such a revolution of public sentiment, are sufficient rebuke to Mr. Carlisle's free-trade notions. Mr. Morrison, the free-trade chairman of the Committee on Ways and Means, is sent to the rear by an overwhelming vote. Mr. Hurd, who shouted fraud against his successful Republican protectionist opponent in 1884, was even more routed in his efforts to secure a vindication before his former constituents last week. In Virginia the development of iron and other metallurgical industries in mines, mining and manufactures exercised the most powerful effect upon the elections. As a distinctive issue the pro-British movement in the United States has received a blow which will make its advocates see that the American voter as a rule takes no stock in visionary schemes of foreign economists.

The Duty on Iron Ore.

Messrs. Cooper, Hewitt & Co., have sent the following letter to the Secretary of the Treasury, under date of October 21. "On the 23d of September, 1886, a statement was signed by a considerable number of importers of iron ore, declaring certain facts as to the manner of paying for such ore, and expressing an opinion based on these facts as to the meaning of the term 'iron ore' in commerce. A copy of this statement is hereto appended. This firm, through one of its members, signed the statement referred to, which it would not have done upon more careful consideration. First, because the firm is not an importer of foreign ore, but only a large purchaser thereof; secondly, because it seems preferable to make a simple statement of the facts, leaving the duty of drawing inferences to the officers of the Government, to whom it belongs.

"The following particulars, taken from a wide experience in the purchase of foreign ores, are therefore submitted. They explain more in detail the general declaration of the importers above mentioned. In purchase of foreign ores payment is based as a rule upon the actual quantity of iron contained in the ore. This is ascertained by chemical analysis of the ore, dried at 212° F. This drying removes the water which may be present as moisture, but it does not remove the water which exist in many ores in chemical combination as part of the mineral itself. Thus, for instance, Porman ore imported from Carthage, Spain, may contain, after drying at 212° F., as much as 9 or 10 per cent. of 'combined water.' Mata ore from Santander, Spain, was found to contain, after similar drying, over 12 per cent. combined water. This water is considered an ingredient of the ore. A common form of contract fixes the price at so many cents per unit of metallic iron per ton of 2240 pounds of ore dried at 212° F. In settlement of such contracts the bill rendered by the importer states, first, the gross weight of the cargo returned by the United States Custom-House weigher; from this is deducted the amount of moisture, as determined by the chemist in drying the samples. The remainder is considered the quantity of ore to be paid for at so much per unit (that is, for each unit per cent.) of metallic iron contained in it. Another form of contract fixes the price at so much per unit of iron, as determined by analysis, in the material actually delivered. In this case, as in the former, the chemist is obliged to dry his sample at 212° F. before analysis, and the result of his analysis shows the percentage of iron in the dried ore; but he then recalculates the percentage upon the wet ore as a basis, and the bill is rendered accordingly.

"Thus, to take a simple example, a cargo of 1000 tons, containing 10 per cent. moisture—that is, 900 tons of dried ore and 100

tons of water not chemically combined—is sold at 10 cents per unit of metallic iron. The chemical analysis of the dried ore gives 60 per cent. as the contents of iron. Under the first form of contract above described the bill would be rendered for 900 tons of ore at 10 cents per unit, or \$9 a ton, amounting to \$5400; under the second form of contract the chemist would report that the ore lost 10 per cent. in drying, that the dried ore contained 60 per cent. of iron, and that this (being 60 per cent. of 90 per cent.) was equivalent to 54 per cent. of the total weight of the cargo. In this case the bill would be rendered for 1000 tons at 10 cents per unit, or \$5.40 per ton, amounting to \$5400, as before. It is evident that, under all circumstances, the two forms of contract give the same result as to price, and secure the purchaser as against variations due to the accidental absorption of more or less water by the ore. These variations may be very large by reason of season, weather, &c., and, if they were not eliminated by the methods of sale described, no foreign ore could gain a reputation which would serve as a guarantee of its value and justify the making of contracts for future delivery.

The amount of water chemically combined in a given ore is, on the contrary, practically constant for that ore, and hence can be taken into account by purchasers in considering the metallurgical value of the ore, of which it is as much a part as the silica, oxygen or other ingredients. This water, as has been observed above, is not removed by heating at 212° F. It is not intended to express here any opinion upon the legal bearing of the above facts; but it is deemed proper to point out, as an additional fact, that, if the gross weight of the cargo of foreign ore, including its uncombined moisture, be taken as the actual weight of ore subject to duty, the result is a levy of very different duties at different times upon the same ore; and since the additional moisture is no benefit, but an injury, to the metallurgical value of the ore (though, as has been explained, it is not paid for by the purchaser), the highest duty will thus be laid on the ore which is in the worst condition."

This letter confirms fully the statement made by us recently that contracts for foreign iron ore are made in a manner which does not justify the ruling of the Treasury officials as to the proper commercial significance of the term "iron ore."

An assertion having been made that colored laborers at the South were for 60 and 70 cents a day, the *Times*, of Chattanooga, says: "Careful investigation here reveals the fact that the lowest wages paid to colored laborers in any industry is 90 cents a day, and this rate covers only a few at the South Tredgar Iron Works. The greater number of colored men at those works receive wages running from \$1 to \$3 per day, with a large number at the intermediate rates of \$1.25 and \$1.50 per day. In every case where skilled colored men are employed as heaters, puddlers, helpers, &c., they get exactly the same wages as white men doing the same work. Colored laborers at the Chattanooga furnaces get \$1.25, \$1.50 and \$2 per day, according to the skill, responsibility, &c., required to fill the various places in which they work. These are representative Southern industries. This applies also to Birmingham, Knoxville and other places. Colored boys in the South Tredgar Nail Works, working as feeders, make from 75 cents to \$1.25 per day, according to the skill and industry displayed in their labor. Some colored men make as high as \$4 per day as puddlers and molders in this section."

An interesting case has come up in Philadelphia through the effort of a firm of carpet manufacturers in Philadelphia to protect a trade secret. John & James Dobson have filed a bill in equity against Charles Dempsey and Joseph Walker, two former employees. The plaintiffs allege that they have in their mills at the Falls of Schuylkill valuable looms for weaving "double-pile" fabrics which have not been patented, but which have been improved by them at the expense of a great deal of time and labor. Dempsey was in the machine shop, where he became familiar with the construction of these looms. He took advantage of his position to perfect models and working plans which he has offered to sell through Walker for \$5000. The plaintiffs ask the court to order the defendants to destroy or deliver up the model. Judge Biddle granted a preliminary injunction restraining them from offering it for sale and from giving to the public information which they acquired while in the plaintiffs' employ.

It is reported that at the next meeting of the Connellsville Coke Syndicate, which will be held about the middle of the present month, an effort will be made to advance the price of coke. For some time past the operators in the region have been unable to get a sufficient number of cars to transport the coke, so great is the demand at present. It is claimed that shipments would average about 1000 cars per day were proper shipping facilities afforded, but that some days not more than 500 cars are moved.

Much work in the mining machinery line, which used to be done in San Francisco for Arizona and Montana, has been cut off, says a California paper, because of the construction of railroad lines through these districts, by means of which Eastern manufacturers are placed at an advantage over local manufacturers. In consequence of all this the outlook for the trade there is not good, competition is keen, work slack and prices unsatisfactory.

The hydraulic ram is one of the most neglected of useful instruments. Water is often elevated by expensive means when it might be cheaply done with the ram.

Oil is said to have been struck in New Zealand, a well producing 50 barrels per day being in operation at Gisborne.

A machine for cutting leather lacings has been invented in Boston. Each machine, it is claimed, can do the work of 10 men.

Report of the Disston Steel Workers' Committee.

The committee selected by Henry Disston & Sons, of the Keystone Saw, File and Steel Works, at Tacony, and their employees, to investigate the wage schedule in force in Pittsburgh establishments, yesterday made public their report, which was to the effect that the firm was paying higher wages than any of the Western manufacturers. The committee was appointed on October 13, at the conclusion of the strike of steel-makers, who desired a 10 per cent. advance in wages, on condition that "the highest rate of wages shall be paid to and accepted by our men." The full text of the report is as follows:

"The Board of Arbitrators appointed to visit Pittsburgh to examine into the rate of wages paid there for steel melting and rolling, in accordance with terms of agreement entered into between the firm of Henry Disston & Sons, of the first part, and the employees in their steel works, of the second part, on October 14, 1886, respectfully report that, after a careful and exhaustive investigation of the system of wages, weights and hours of working in the steel works of Pittsburgh, we find the schedule of prices as paid before the strike in our steel works, and still in force in said works, to be considerably higher than the prices paid by any steel manufacturing establishment in Pittsburgh, and that there is no just cause for the recent strike of the employees.

"We therefore, in accordance with the result of our investigation, suggest that the steel-melting and rolling-mill department be reorganized, and that the Pittsburgh system of working be adopted, so that we may be the better able to compete with Pittsburgh manufacturers, who, in addition to their economical system of working, have a great advantage over us in the use of natural gas. Accompanying this you will find a detailed report of our investigation."

The itemized report of the committee's investigation is appended: "At the closing meeting of the Arbitration Board appointed to adjust the late strike in the steel works department of Henry Disston & Sons the following decisions were arrived at:

"1. That Henry Disston & Sons had lost almost all of their outside sheet-steel trade.

"2. That it was not owing to the inferior grade of the steel manufactured by them.

"3. That it was owing to their inability to compete in price with Pittsburgh manufacturers, who have an advantage in their system of paying for work done and the natural gas for fuel.

"4. That \$4.50 is the highest price paid in Pittsburgh for melting steel per ton, and not \$5, as stated in the firm's circular.

"5. That Henry Disston & Sons pay \$6.75 per ton for melting on their gas fires and \$8.30 on their coal fires, and 50 cents per ton extra on cross cut ingots.

"6. That in Pittsburgh they have two pullers out on a 24-pot furnace, as we do, but they work differently, each pulling out 12 pots per heat, three heats per day, for \$2.65; this makes 22½ cents per pot for three heats, at which rate they get paid for pulling more than 12 pots on furnaces which are larger than ours. They have no teeming to do; the melters on each furnace assist the others, whereas our pullers-out work as follows: One pulls out 16 pots, the other pulls eight pots and teems eight, which is equivalent to pulling out 16. For this we pay \$3.37½ per day of three heats.

"7. That in Pittsburgh molders are paid \$1.80 per day of three heats for putting together 12 molds or less when ingots are larger than 90 pounds each, whereas our molders are obliged to put together a number of small molds, for which they receive \$2.30 per day.

"8. That in Pittsburgh larger ingots are made, which is a great advantage to the firm and men.

"9. That larger crucibles are used in Pittsburgh and heavier weight charged. This is also a great advantage to the firm and the men.

"10. That by adopting the Pittsburgh system it would increase the product of our gas furnaces 20 per cent. and reduce the general expense.

"11. That in the majority of the Pittsburgh steel works no reduction is made for defective ingots.

"12. That in Pittsburgh the melters or their helpers fill their own pots.

"13. That no chipping of any account is done in Pittsburgh, but the fins are knocked off by the melter and his men.

"14. That the Pittsburgh melters do knock off ends or top ingots, as they term it.

"15. That, owing to the extra amount of carbon used in melting in Pittsburgh, they can get a heat out in 3½ hours.

"16. That on a 24-pot furnace they do not have an extra pourer at \$2.50 per day in addition to the two pullers-out.

"17. That \$4.50 per ton pays all the wages on a 2

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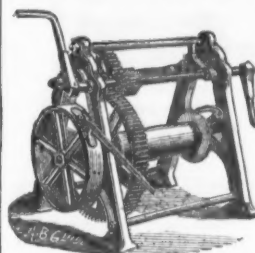
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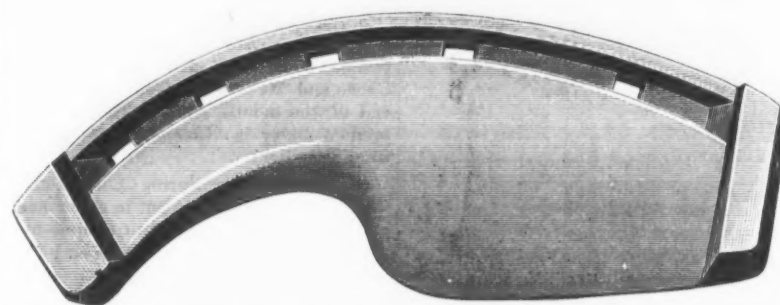
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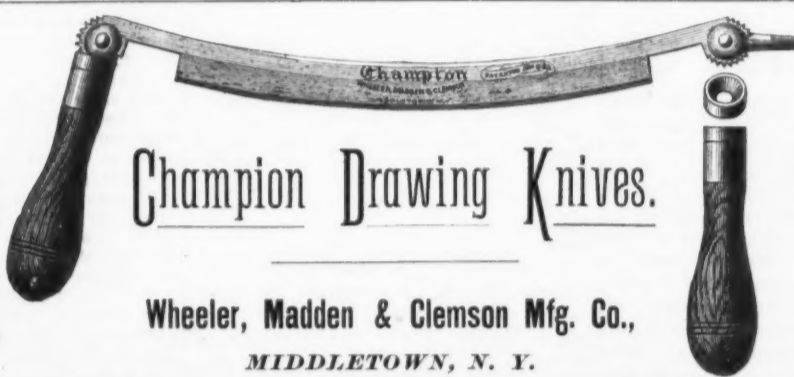
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Livingston Horse Nail Co., 104 Reade, N. Y.	38
Arms and Ammunition	
J. Stevens Arms and Tool Co., Chicopee Falls, Mass.	34
Asbestos	
Chalmers-Spence Co., 419 8th, N. Y.	9
Axles and Bits	
Recher F. H., Seymour, Conn.	30
Bridgeport Gun Implement Co., Bridgeport, Conn.	30
Jameson C. & Co., Chambers, N. Y.	28
New Haven Copper Co., 294 Pearl, N. Y.	2
Axle Greases	
Lovell, Tracy & Co., Hartford, Conn.	2
Axles, Springs, &c., Manufacturers of	
Gautier Steel Dept., Cambria Iron Co., Johnstown, Pa.	38, 39
Liggett Springs & Axle Co., Pittsburgh, Pa.	38
Wurster F. W., Brooklyn, N. Y.	44
Axe Wedges	
Brooks, H. & Co., Boston, Mass.	33
Axes	
Francis Axe Co., Buffalo, N. Y.	28
Peck A. G. & Co., Buffalo, N. Y.	28
Powell Tool Co., Cleveland, O.	30
Band Saws	
Przybil P., 467 W. 40th St., N. Y.	13
Banks	
Gallaudet P. W. & Co., 2 Wall, N. Y.	13
Bar Iron	
Virginia Nail and Iron Works Co., Lynchburg, Va.	16
Barb Wire & Fence	
Gautier Steel Dept., Cambria Iron Co., Johnstown, Pa.	38
Iowa Barb Wire Co., 88 Reade, N. Y.	2
McDonnell Iron & Steel Co., Burlington, Vt.	38
Thorn Wire Hedge Co., Chicago, Ill.	2
Washington & Moen Mfg. Co., Worcester, Mass.	2
Bed Clothes Clamps	
Conner, E. M., Chicago, Ill.	30
Bellevue Manufacturers of	
Bullock T. H., Cleveland, O.	18
Scott Geo. H., Chicago, Ill.	18
Bells	
Barton Bell Co., East Hampton, Conn.	10
Chapman Mfg. Co., Meriden, Conn.	10
Bells (Sleigh)	
Bevin Bros. Mfg. Co., Easthampton, Conn.	10
Belted, Makers of	
Alexander Bell Co., 113 N. 3d, Philadelphia, Pa.	28
Bain Belting Co., Philadelphia, Pa.	28
N. Y. Belting & Packing Co., 13 and 15 Park Row, N. Y.	13
Bench Hooks	
Stearns & Co., Syracuse, N. Y.	44
Bird Cages, Makers of	
Heins & Munschaer, Buffalo, N. Y.	10
Lindeman O. & Co., 254 Pearl, N. Y.	2
Maxwell John, 247 and 249 Pearl, N. Y.	2
Osborn Mfg. Co., 79 Blacker, N. Y.	33
Blind Awning Fixtures	
North F. G. & Co., Buffalo, N. Y.	10
Blocks, Tackle, Makers of	
Bagnall & Lord, Boston, Mass.	11
McMillan Wm. & Co., 113 South 4th, N. Y.	11
Penfield Block Co., Lockport, N. Y.	10
Shubert & Cottingham, Philadelphia, Pa.	11
Bolter Plates	
Wm. McIlvain & Sons, Reading, Pa.	41
The Seld & Hastings Co., Wilmington, Del.	24
Bolter Tubes	
N. Y. Supply Co., 30 and 52 John, N. Y.	13
Bolters, Steam	
Babcock & Wilcox Co., 30 Cortlandt, N. Y.	10
Edge Moor Iron Co., Wilmington, Del.	33
Wetherill Robt. & Co., Chester, Pa.	43
Bolt and Rivet	
Chambers & Co., Philadelphia, Pa.	43
Bolt Cutters	
Howard Iron Works, Buffalo, N. Y.	41
Sellers Wm. & Co., Philadelphia, Pa.	79
Liberty, N. Y.	43
Wiley & Russell Mfg. Co., Greenfield, Mass.	44
Books	
American Well Works, Aurora, Ill.	32
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Amidon & White, Buffalo, N. Y.	43
Ives W. A. & Co., New Haven, Conn.	31
Braces	
Amidon & White, Buffalo, N. Y.	43
Saxton & Osgood, Buffalo, N. Y.	43
Brass, Manufacturers of	
Amidon & White, Buffalo, N. Y.	43
Bridgeport Brass Co., Bridgeport, Conn.	30
David John & Sons, 10 John, N. Y.	10
Holmes, Booth & Hayden, 25 Park Place, N. Y.	10
Plume, N. Y.	10
Seville Mfg. Co., 451 Broome, N. Y.	2
Waterbury Brass Co., 298 Eway, N. Y.	2
Brass Bolt Hinges	
Tiebout W. J., 16 and 18 Chambers, N. Y.	24
Brass Castings	
Woodruff, Miller & Co., Mt. Carmel, Ct.	33
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McFarland Wm., Trenton, N. J.	4
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Iron Bridge Co., East Berlin, Conn.	43
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Union Bridge Co., 18 Broadway, N. Y.	40
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Carr, Spencer & Co., New York, N. Y.	33
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Wilson John, Sheffield, England	36
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Saxton & Osgood, Buffalo, N. Y.	43
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Satton & Westcott, Philadelphia, Pa.	5
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Stanley Works, New Britain, Conn.	39
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Canisters and Dividers	
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Can Screws	
Herr Fruit Jar Co., Philadelphia, Pa.	16
Car Axles	
Robert A. & P. & Co., 265 S. 4th, Phila.	5
Car Wheels	
Knoxville Car Wheel Co., Knoxville, Tenn.	34
Union Foundry and Putnam Car Wheel Works, Chicago, Ill.	43
Whitney A. R. & Co., 17 Broadway, N. Y.	9
Carriage Hardware, Makers of	
E. D. Clapp Mfg. Co., Auburn, N. Y.	8
Ohio City Mfg. Co., Westville, Ohio	8
Smith H. D. & Co., Pleasantville, Conn.	12
Woodruff, Miller & Co., Mount Carmel, Ct.	33
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Hochstadt Carriage Works, Syracuse, N. Y.	38
Castings, Iron	
C. Cheney & Son, Malpas, N. Y.	28
Halgate & Co., Albany, N. Y.	37
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Kureks Cast Steel Co., Chester, Pa.	44
Flagg Stanley G. & Co., Philadelphia, Pa.	44
Johnson L. G. & Co., Spuyten Duyvil, N. Y.	44
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Standard Steel Casting Co., Thurston, Pa.	44
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The U. S. Mill Co., 26 Broadway, N. Y.	3
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Bradley & Co., 816 Richmond St., Phila.	5
Cover Mfg. Co., 263 Third St., N. Y.	6
Salom & Westcott, Philadelphia, Pa.	5
Chemicals	
Singer & Amend, 205 Third St., N. Y.	6
Salom & Westcott, Philadelphia, Pa.	5
Cherry Motors	
Enterprise Mfg. Co., Philadelphia, Pa.	38
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Back Bros., Milbury, Mass.	18

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Union Mfg. Co., 103 Chambers, N. Y.	7
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Woodruff, Miller & Co., Mt. Carmel, Ct.	33
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Dunbar Bros., Bristol, Conn.	7
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Horden & Lovell, 70 West, N. Y.	36
Fardee A. & Co., 111 Broadway, N. Y.	36
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Van Wagner & Williams Co., 82 Beekman, N. Y.	44
Cocks, Steam, Gas, &c.	
Fairbanks & Co., 311 Broadway, N. Y.	43
Coffee and Spice Mills	
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Schoonmaker J. M., Pittsburgh, Pa.	4
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Graham H. H. & Co., 113 Chambers, N. Y.	8
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The Fred J. Myers Mfg. Co., Covington, Ky.	3
Corn Shellers	
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Cincinnati Corrugating Co., Cincinnati, O.	34
Moseley Iron Bridge & Roof Co., 5 Day, N. Y.	4
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Coverings, Boiler and Pipe	
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Curry Candles	
Sweet & Clark Mfg. Co., Troy, N. Y.	33
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Clatworthy F. & W., 82 Chambers, N. Y.	10
Cutlery, Manufacturers of	
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Shepard Hardware Co., Buffalo, N. Y.	28
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Medford Fancy Goods Co., 707 Broadway, N. Y.	37
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Watts Mfg. Co., 480 Pearl, N. Y.	40
Door Hangers, Hoes and Bars	
Dunham Mfg. Co., Boston, Mass.	33
Stanton & Osgood Co., Buffalo, N. Y.	30
Syracuse Bolt Co., Syracuse, N. Y.	31
Victor Mfg. Co., Newburyport, Mass.	31
Door Springs	
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Universal Drilling Co., Cincinnati, O.	44
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Philadelphia Drop Forge Co., Philadelphia, Pa.	30
The Billings & Spencer Co., Hartford, Conn.	7
William Rose & Bros., West Phila., Pa.	7
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White L. & J., Buffalo, N. Y.	10
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Falck, Diehl & Co., Philadelphia, Pa.	31
Electric Lighting	
The Edison Electric Co., Cleveland, O.	6
Western Electric Co., Chicago, Ill.	2
Electrical Supplies	
Westinghouse, Church, Kerr & Co., 17 West 4th, N. Y.	12
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Elevators, Makers of	
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Emery Paper, Cloth, &c.	
Walpole Emery Mills, South Walpole, N. H.	24
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Northampton Emery Wheel Co., Northampton, Mass.	4
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Cooke & Co., 22 Cortlandt, N. Y.	10
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Engravers	
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Cooke & Co., 22 Cortlandt, N. Y.	10
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S. Obermayer Foundry Supply Mfg. Co., Cincinnati, O.	3
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National Wire and Iron Co., Detroit, Mich.	3
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Chelmsa File Works, Norwich, Conn.	8
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Ogden & Wallace, 85 to 91 Elm, N. Y.	4
Pierston & Co., 24 to 27 West, N. Y.	4
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ington streets, N. Y.	4
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Sanna, Frs. R., Potomac, Pa.	4
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burgh, N. Y.	37
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Moulton W. R., Burlington, Vt.	30

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Jaude Bros., Fairport, N. Y.	3
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Broth, Garrett & Blair, 919 Chant, Phila.	3
Edison, 310 Walnut, Phila.	3
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Molding Sand.	
Paxson J. W. & Co., 514 Beach, Phila.	3
Mouse Traps.	
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Slipley Mfg. Co., Erie, Pa.	3
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Birmingham Iron Foundry, Birmingham,	
Pittsburgh Mfg. Co., Pittsburgh, Pa.	3
Nail Sets.	
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Columbus Bolt Co., Columbus, O.	3
Port Chester Bolt and Nut Co., Port	
Chester, N. Y.	3
The Alentona Rolling Mills, Alentona,	
Wm. H. Haskell Co., Patuxent, Md.	3
Russell, Bursdall & Ward, Port Chester	
Wilson J. Fred, Worcester, Mass.	3
Oil.	
Berg, Galt Jar Co., Philadelphia, Pa.	3
Oil Stones.	
Chase Geo. 107th & Harlem River, N. Y.	3
Oil Torches.	
Hull Vapor Stone Co., Cleveland, O.	3
Ore Crankers.	
Young G. & Co., Cortlandt, N. Y.	3
Ore Digs.	
MacLeanahan & Stone, Hollidaysburg, Pa.	3
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P.	
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Plumbers' Materials, Manufacturers of	
Everhart & Son, Scranton, Pa.	3
Waterbury & Stillman, 304 E. 43d, N. Y.	3
Polish, Stove and Metal.	
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Patents, "Silver King"	
"Silver King"	
Power Hammers.	
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town, Conn.	3
Presses, Dies, &c.	
E. W. Bliss Co., Brooklyn, N. Y.	3
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J. E. Quickelbusch & Sons, 535 Eighth St., N. Y.	6
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The Charles Parker Co., Meriden, Conn.	34
Yale & Towne Mfg. Co., Stamford, Conn.	13
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Harrington & Co., Worcester, Mass.	41
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The Weight of Iron: Being Tables of the Weight of Plates One Inch to Four Feet thick; also the Weight of Round, Square and Flat Bars, Angle and Tee Iron. By W. I. GIBBS. . . \$0.40

Journal of the Iron and Steel Institute. . . \$1.25

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The Structure of the Wool Fibre and its Relation to the Use of Wool for Technical Purposes. F. H. BOWMAN. . . \$0.50

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Handbook of Useful Tables for the Lumberman, Farmer and Mechanic. . . \$1

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The Wood Carver; With Instructions Containing 34 Full-Page Designs. By J. S. GIBSON. . . \$1

Tobacco: Growing, Curing and Manufacturing. A handbook for Planters in all Parts of the World. By C. G. W. LOCK. . . \$1

Any Book Published will be sent, postpaid, to any address on receipt of price by

DAVID WILLIAMS, Publisher and Bookseller, 66 and 68 Duane Street, New York.

WANTED.

A good business man with \$5000 to \$10,000 to take third interest in a prosperous Hardware Manufacturing business and travel. Address

* HARDWARE, Lock Box 186, Philadelphia.

WANTED.—The Agency for a first quality brand of Tool Steel, also other grades of Crucible and Open-Hearth Steels, by one with over 10 years' experience in selling these grades. Would locate in New York City and look after the Middle States and New England business. Address "STEEL AGENCY," Office of The Iron Age, 66 and 68 Duane St., New York.

WANTED.—A vertical steam engine, second hand or new, of say, from 24-inch to 28-inch diameter of Cylinder, by say, 36-inch stroke, with or without crank-shaft, but must be large enough to carry a 12-inch diameter crank-shaft. State its condition, where it can be seen, by whom built, and price.

THE PARKSBURG IRON CO., Parksburg, Chester Co., Pa.

For Sale, Cheap.

Machinery of an axle works complete consisting of 2 Steam Hammers, 22 Lathes, 2 Box Boring Machines, 1 Grav's Nut Machine, Tools for same, 1 Drill Press, 1 Thread-Cutting Machine, 1 Upright Borer, 1 Howe Scale, Blacksmith and Furnace Tools, 1 Sturtevant Blower, Shafting, Pulleys, Belting, &c., situated at Bound Brook, N. J. Address

L. D. COOK, Bound Brook, N. J., and NORMAN M. JONES, 15th St. and Fairmount Ave., Philadelphia.

FOR SALE, SECOND HAND.

One 600-pound Drop Hammer and one 25-pound Trip Hammer, also 125 feet of 8-inch No. 13 Galvanized Blast Pipe, riveted and soldered; all in good order. Address

AULTMAN, MILLER & CO., Akron, Ohio.

GOOD, LIGHT OFFICES TO LET.

9 Chambers St. Rents \$250 to \$400. Apply to GEORGE W. BRUCE, on premises

WANTED.—By one with fifteen years' business experience, a position as correspondent and confidential clerk or assistant manager in a manufacturing concern. Past experience has been in the steel and iron line, as salesman, correspondent, &c., also in manufacturing. Would be willing to do some traveling, also make New York as headquarters, or vicinity. Address "CORRESPONDENT," Office of The Iron Age, 66 and 68 Duane St., New York.

HARDWARE BUSINESS FOR SALE.

The oldest, largest and best established Hardware store in Lincoln, Neb., for sale. Stock consists of Shelf and Heavy Hardware, Iron, Wagon Material and Wood Stock, and is in fine condition. Will inventory about \$200,000. Best location in city. Lincoln has 30,000 inhabitants and growing rapidly. Union Pacific, Chicago and Northwestern, Missouri Pacific and C. & N. W. Railroads in and out. This is a bargain for a live hardware man. Address

THE BAUM HARDWARE CO., Lincoln, Neb.

A gentleman who is a thorough and experienced hardware man and has a large acquaintance among the Jobbing trade desires the agency of manufactures for heavy and shelf hardware for the principal cities in the West.

* CHICAGO AGENCY, 65 Sheffield Ave., Chicago.

To Manufacturers of Hardware Specialties. For Sale: half interest in United States, Canada and English Bottom Patents on Magazine Target Trap. Illustrated in this paper some time ago. The only trap suitable for practice with Repeating Arms, Patterns, Dies, Press, &c., in complete working order. Profits large.

Address JOS. L. RAUB, New London Conn.

Special Notices.

A Safe Boiler.

A Boiler Insurance Company has published the following and sent it far and near, with the apparent intention of causing the public to believe that a BABCOCK & WILCOX BOILER has exploded:

A LOSS PAID ON A BABCOCK & WILCOX BOILER, WHICH IS CLAIMED TO BE NON-EXPLOSIVE AND ABSOLUTELY SAFE.

OFFICE OF BROOKLYN SUGAR REFINING COMPANY, BROOKLYN, N. Y., October 20, 1886.

AMERICAN STEAM BOILER INSURANCE COMPANY. GENTS: We desire to express to you our gratification and our thanks for the prompt manner in which the recent loss was adjusted upon one of our Babcock & Wilcox boilers, having received within two hours after rendering proof of loss to you the full amount of our demand for the damage to our boiler, and also the payment of the claim of Patrick Stapleton, one of our workmen, who was scalded by the escaping steam.

Yours truly, BROOKLYN SUGAR REFINING COMPANY, J. A. STURBERG, Secretary.

It seems to be a settled policy of all Boiler Insurance Companies to discourage the use of Safety Boilers, as the fear of explosion is the greatest inducement to take out policies. But the apparent reason of publishing and sending the above notice with the following words in large type, "A Loss paid on a Babcock & Wilcox boiler, which is claimed to be non-explosive and absolutely safe," is evidently grudge or spite, accounted for mainly from the fact that at one time they endeavored to have the BABCOCK & WILCOX CO. treat with them for a general line of insurance on all of their manufactures, which was declined by this Company on the ground that they had no confidence either in the stability of the company or the honesty of its management. The departure of the treasurer of said Insurance Company soon thereafter for Canada, where he has since, as far as known, remained, shows that the opinion of the BABCOCK & WILCOX CO. was not without foundation.

The following letter shows the actual facts in the case referred to:

OFFICE OF BROOKLYN SUGAR REFINING CO., BROOKLYN, N. Y., October 20, 1886.

Messrs. The Babcock & Wilcox Co., New York.

GENTLEMEN: In reply to yours of 29th inst., would say that we sincerely regret that our letter of 29th inst. to the American Steam Boiler Insurance Company should in any way reflect upon the quality of your boilers, as we certainly did not intend to convey any such impression. Our high opinion of your boilers we believe to have demonstrated thoroughly by the repeated orders that we have given you since 1876. The unfortunate accident referred to was caused by the negligence of our man in charge of the boilers, who was consequently, after proper investigation, promptly discharged for allowing the water to get low. This caused several tubes to be badly burned and ruptured, which was the only damage done to property.

The injury done to Patrick Stapleton by the escaping steam was fortunately so slight that he was enabled to return to work on the second day following the accident.

We shudder to contemplate what the result would have been had we had in use any other style of boiler.

Yours truly, BROOKLYN SUGAR REFINING CO., JOHN A. STURBERG, Secretary.

Twenty years' use and upwards of 300,000 horsepower sold, without a single explosion, demonstrate that these boilers are all that is claimed for them.

For a SAFE, ECONOMICAL and DURABLE BOILER which REQUIRES NO INSURANCE AGAINST EXPLOSION, purchase of the

BABCOCK & WILCOX COMPANY,

30 Cortlandt St., New York. 107 Hope St., Glasgow. New York, Nov. 1, 1886.

SPECIAL NOTICE.

WANTED, Steel Wire Rope.

Sheet and Light Iron Scrap.

Also all kinds of Iron and Steel Scrap.

THOMPSON C. GILL & CO.,

210 So Third Street, Philadelphia, Pa.

Ten Per Cent. Stock.

An old-established Manufacturing Company (Iron) in Chicago will sell a limited amount of stock for purpose of increasing their business, which now crowds their capacity; will pay not less than ten per cent dividend per annum; fullest investigation solicited; could take a young man who wants to learn the business. Address, with references, "CHICAGO," Box 797.

Office of The Iron Age, 66 and 68 Duane Street, N. Y.

WANTED.

By reliable party who has sold a Hardware specialty to Philadelphia jobbers the past ten years, one or more reputable manufacturers of Hardware Specialties to represent in Philadelphia. Can furnish undoubted reference as to ability and character. Address GEO. W. ALWARD, 631 W. Fifth St., Camden, N. J.

IRON AND STEEL

Rails, Blooms, Billets, Rods, &c., inspected during manufacture and on delivery at any works in Germany or Belgium. 13 years' practical and continuous experience. Highest references. Correspondence solicited.

WILLIAM OWEN, Dusseldorf, Germany.

For Sale, Cheap.

Nearly new, a Wm. Sellers & Co., 24-inch Upright Boring and Turning Mill complete.

JOSEPH LUMLEY, 144 W. Third St., Philadelphia.

FOR SALE.

A Circular Cold Sawing Machine for cutting Iron or Steel Rails, Joists, Girders, T Iron, &c. Can be run by hand or power; gives a clean and accurate cut, avoiding fractures and saving time. Having been purchased in trade, will be sold very reasonable. For particulars and price, address

FEDRICK & AYER, Philadelphia, Pa.

WANTED.

an agent to sell Anvils, Vices and Hammers and Chains. Apply, stating terms required, to

Mr. JOHN BROOKS, Lock Works, Lye, near Stourbridge, England.

Special Notices.

Machinery and Engines.

Second-Hand and New.

Engine Lathes.

30-inch Swing x 22 ft Bed, New Haven.

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Special Notices.

Second-Hand Machinery in Good Order. For Sale Cheap.

1 Engine Lathe, 30 in. x 17 ft. bed. 1 cond.

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Trade Report.

New York.

American Pig.—The market is still confined to jobbing sales, the volume of business being moderate. Standard brands are very scarce and sales are chiefly of outside Irons. The growing strength in the West gives encouragement here, and there is a feeling that \$20 may be the price named for next year's contracts, with the reservation, however, that the markets abroad hold up fairly well. We quote standard brands No. 1 quality, \$19 @ \$19.50; No. 2, \$17.50 @ \$17.75 and Gray Forge, \$16 @ \$16.50.

Scotch Pig.—The market is quiet, high cost restricting business to the absolutely necessary purchases. We quote as follows for moderate-sized lots: Coltness, \$21.75 @ \$22 to arrive; Gartsherrie, \$20.75 @ \$21; Shotts and Langloan, \$20.75 @ \$21; Carnbroe and Glengarnock, \$19.50 @ \$20; Summerlee, \$21; Dalmellington, \$19.75 @ \$20; Eglinton, \$19 @ \$19.50, and Clyde, \$19.50 @ \$20.

Bessemer Pig.—Nothing has been done in Foreign Bessemer Pig, the rise abroad bringing quotations here to \$19.75 @ \$20, at which business is out of the question in competition with Domestic. There have been some transactions in the latter, and in the Pittsburgh market higher prices have been obtained. We quote \$18.25 @ \$18.50 at furnace for Domestic.

Spiegeleisen.—Although there have been some inquiries, there have been no sales of Spiegeleisen during the week. Importers ask higher prices, the quotation for German being \$27 @ \$27.50, and for English 20¢ @ \$27.50 @ \$28.

Structural Iron and Steel.—A good deal of business is coming up, and some sellers are so well employed for the future that they are growing indifferent. There have been placed about 1800 tons of Iron for bridges at Panama, with more than than a like quantity still coming forward. Channels for carwork are in active demand. We quote, according to quality, for Angles 2.1¢ @ 2.25¢, delivered, and Tees at 2.5¢ @ 2.6¢, for round lots. Steel Angles are quoted 2.40¢ @ 2.50¢, according to quality. Store quotations remain 2.45¢ @ 2.50¢ for Angles and 2.75¢ @ 2.8¢ for Tees. American Beams and Channels are 3¢ base from dock for all orders.

Bar Iron.—The activity in orders for carwork continues, and the concessions to the demands of the men in Eastern Pennsylvania foreshadow a further advance. We quote: Common, 1.65¢ @ 1.75¢, Medium, 1.75¢ @ 1.85¢ and Refined, 1.85¢ @ 2¢.

Merchant Steel.—We quote nominally for the range of ordinary to good grades as follows: American Tool Steels, 7½¢ @ 9¢; Tool Steel of special grades and finer qualities, 12¢ @ 20¢; English Tool, 13¢ @ 15½¢; common grades, 7¢ @ 9¢; Crucible Machinery, 3.75¢ @ 4.50¢. The Steel Association quote base prices: Round and Flat Spring, 2.6¢; Round-Edge Tire, 2.3¢; Square-Edge Tire, 2.5¢; Toe Calk, 2.4¢; Sleigh Shoe, 2.2¢ @ 2.5¢; Open-Hearth Machinery, 2.5¢, and Bessemer Machinery, 2.5¢.

Plates.—Inquiries are numerous, and are above the capacity of the mills to supply. The tendency is upward. We quote for round lots: Common or Tank, 2.25¢ @ 2.35¢; Refined, 2.35¢ @ 2.40¢; Shell, 2.5¢ @ 2.6¢; Flange, 3.40¢ @ 3½¢; Flange, Extra, 4¢ @ 4½¢. For small lots of Steel Plates the quotations are as follows: Tank, 2.70¢ @ 2.75¢; Ship, 3¢; Shell, 3¼¢; Flange, 3½¢, and Fire-Box, 4¼¢ @ 4½¢, on dock.

Steel Billets and Slabs.—Steel Billets are quiet. In Nail Slabs a sale is reported of 2500 tons for 1887 delivery at Philadelphia at \$29.50.

Steel Wire Rods.—There have been a number of sales of round lots of Rods for 1887 delivery at rising prices, the bulk of the business having been done at \$37 @ \$37.50, with higher prices now asked. We quote \$37.62½ @ \$38.

Steel Rails.—A very heavy business has been done, and, besides, a number of transactions quietly made during the past few weeks and not reported by us have come to light. Mr. Gould has bought 40,000 tons of American Rails from two Pennsylvania mills, and has taken 20,000 tons of Cammell (English) Rails at a little over \$38 at New Orleans. In addition to this we note 25,000 tons for a former narrow-gauge road now widening to standard gauge, also taken by a Pennsylvania mill. The Manitoba has bought 20,000 tons from an Eastern mill. There were sales furthermore of 10,000 tons to a new enterprise in the Northwest, given to a Western mill, in addition to a similar lot reported before as taken by an Eastern works. The Union Pacific has placed about 15,000 tons with two Western works, and a 5000-ton lot for the Northwest was awarded to another mill. We note also sales to three New England roads of 11,000 tons in the aggregate, with others pending; 5000 tons have been also sold to Georgia. The Pennsylvania Railroad has, as usual, distributed its order among the three mills on its line. The amount is reported variously as having

been 33,000 and 48,000 tons in the aggregate. As we go to press there are negotiations pending and probably closed for 30,000 tons by two Western roads, the bulk of which will probably go to Western works. Taking the lower figure for the Pennsylvania, this represents purchases of fully 162,000 tons of Domestic and 20,000 tons of Foreign Rails; 15,000 tons of the latter have also been sold to a Mexican road. It is a matter which is being much discussed in the trade how much in the aggregate the sales for 1887 delivery foot up to date. After thoroughly going over the ground, adding up the contracts which the different mills are known to have secured, the following table has been compiled, the names of the different mills being suppressed. Sufficient to say that the first seven are east of the Alleghenies:

Estimate of Rails Contracted for, 1887 Delivery.	
Gross tons.	Net tons.
A.....10,000	I.....10,000
B.....15,000	J.....10,000
C.....45,000	K.....35,000
D.....85,000	L.....40,000
E.....25,000	M.....25,000
F.....80,000	N.....25,000
G.....100,000	Total.....675,000

We believe that these figures will be a surprise to the majority in the trade, and we may add that we believe them rather under than above the mark. Assuming that the 1887 capacity is a little over 1,500,000 tons, it will be noted that these sales insure nearly half work. The significance of this will be fully understood both by buyers and sellers. We continue to quote \$35 for early delivery, and nominally \$34 at Eastern mill and \$37 at Chicago for 1887 work. There are a number of large orders in the market for the Pacific Coast, over which there will probably be a sharp contest between foreign and American mills.

Old Rails.—Only a few sales of round lots, chiefly for delivery to Western points, are reported; also 2000 tons at \$21, f.o.b. Eastern port. We note also a sale of 200 tons of Old Fish Plates at private terms. We quote nominally \$22 @ \$22.50, bid and asked.

Scrap.—We quote nominally \$19.50 @ \$20 from yard.

Rail Fastenings.—We quote Spikes 2.15¢ @ 2.20¢, delivery New York. Angle Fish Bars are still weak, and may be quoted 1.70¢ @ 1.90¢. Bolts and Square Nuts are 2.50¢ @ 2.75¢, and Bolts and Hexagon Nuts 3¢.

The firm of W. R. Ellis & Co. having been dissolved November 1 by mutual consent, Messrs. Page, Newell & Co., No. 130 Milk street, Boston, have succeeded to the business carried on by the former firm in the sale of the Wrought-Iron Spoke Car-Wheel, manufactured by the Patent Shaft and Axle-Tree Company, of Wednesbury, England, and known as the Brunswick Wheel. Messrs. Page, Newell & Co. have retained the services of Mr. George H. Coney, formerly with W. R. Ellis & Co., who will represent them as traveling agent. Mr. W. R. Ellis, who, as noted above, resigned the American agency for the Patent Shaft and Axle-Tree Company, of Wednesbury, England, proposes hereafter to supply Steel-tired Wheels with center or tires of either American or foreign make, as may be desired by the purchasers. Mr. Ellis retains his former office at No. 18 Broadway, New York.

Philadelphia.

Office of The Iron Age, 220 South Fourth St., Philadelphia, November 9, 1886.

Pig Iron.—The chief feature of the market is scarcity. It is a long time since there was so little Iron for sale, and, to secure anything of desirable quality and for prompt delivery, a good deal of looking around has to be done. But with all that there is no quotable change in prices. There have been no regular rates, however, for some time past, sellers quoting according to the condition of their order-books, some more and some less. The limits for what are regarded as good standard qualities have been from \$18.50 to \$20 at tide for No. 1 Foundry; \$18.50 has been gradually left behind, and \$19 is becoming somewhat exceptional, so that in ordinary transactions about \$19.50 is realized, although a good many are selling at \$20, and say they intend to hold firm at that quotation. The supply of this grade is unusually light, and if the demand continues, as it seems probable, it is almost certain that these or higher figures can be maintained. No. 2 Foundry is not as scarce as the higher grades, so that the price has not changed very much, although an advance of 50¢ can be noted in good brands. Mill Irons are firm, and at about \$16.25 @ \$16.50 at tide for good brands are really scarce, holders demanding at least 50¢ more. The market is somewhat held in check by such brands as Glendon and Andover, which are quoted at the same figures as they have been all summer. Other brands have advanced 75¢ @ \$1, but cannot work so much further unless the others start up, and, as there is a considerable quantity of the brands named on furnace banks, it is not to be supposed that they will be advanced simply to benefit other people. The same remarks apply in some measure to the Thomas Iron Company. The trade are waiting for their quotations on No. 1 Foundry, with this difference, that they have no stocks on hand, and any quotations they name will be for Iron yet to be made. Their capacity is very large, however, and in view of their general conservative policy it is not likely that they will lead in any advances that may be made. Meanwhile, as we have already said, the

market is waiting to see what figures the Thomas Iron Company are going to quote for 1887 deliveries.

Foreign Iron.—There is some inquiry for both Bessemer and Spiegel, but prices seem to be too high for immediate business. Asking prices are \$19.75 @ \$20.25 for Bessemer, and \$27.50 @ \$28.50 for 20¢ Spiegel.

Blooms.—Prices of Foreign Blooms are dearer, 1500 tons of Nail Slabs having sold at \$29.50, c.i.f., duty paid. All grades are held firmer, with quotations about as follows: Rail Blooms, \$27 @ \$27.50, c.i.f., duty paid; Nail Slabs, \$29.50 @ \$30; Sheet-Iron Billets, \$30 @ \$31; higher qualities for Boiler Plate, &c., \$36 @ \$38. American Blooms as follows: Charcoal Blooms, \$50 @ \$52; Runout Anthracite, \$44 @ \$45; Scrap Blooms, \$35, and Ore Blooms, \$34 @ \$35.

Muck Bars.—There is more inquiry, and with increased demand prices are somewhat higher. Sales reported at \$30.50 @ \$31 at mill, and \$32 @ \$32.50 Philadelphia, now held at outside figures.

Bar Iron.—The demand is well maintained and prices are firm, and in some cases a little dearer than they were a week ago. Country mills are getting to work again and have taken a good many orders for Car Iron, but apart from that there is a well-distributed demand, and strictly first-class Bars command good prices—say, 1.9¢ @ 2¢, according to specification, &c. Skelp Iron is still a very important factor, many leading mills being largely employed on that class of work. Sales are reported at from 1.9¢ to 1.95¢ for Grooved and 2.20¢ @ 2.25¢ for Sheared. Prices are firm, and with prospects of continued heavy demand a further advance is not improbable.

Plate and Tank Iron.—The demand for Plates is in excess of the supply; consequently orders are hard to place unless at somewhat higher prices. The mills appear to be all full of work, and anything for this month's delivery is almost out of the question. Prospects are entirely satisfactory; the demand for small lots, in connection with orders already entered, seems to assure full employment for many weeks to come. Prices are firm and look like going higher, but are now quoted about as follows: Ordinary Plate, 2.20¢ @ 2.25¢, delivered; Tank, 2.30¢ @ 2.35¢; Shell, 2.5¢; Flange, 3.5¢; Fire-Box, 4.25¢; Steel Plates, Shell, 3.25¢; Flange, 3.5¢; Fire-Box, 4¼¢ @ 5¢.

Structural Iron.—The demand for new work is moderately active, but is chiefly for small work. Orders on hand are very large, however, and calls for prompt delivery are in some cases extremely urgent. Manufacturers are not seeking for new work, as they have about all they can manage during the next two or three months. The outlook is quite encouraging, and better prices rather than more business are beginning to be looked for, although in the meantime quotations are about as follows: 2.30¢ @ 2.35¢ for Bridge Plate; 2.10¢ @ 2.15¢ for Angles; 2.6¢ @ 2.7¢ for Tees, and 3¢ for Beams and Channels.

Sheet Iron.—The demand is not quite as active as it has been, but stocks are run down to the lowest point known for a long time. Mills are now running on orders as they come in from day to day, and from all appearance are likely to be so employed to the close of the season. Heavy Sheets are also in good demand, with very satisfactory prospects for the near future. Prices are about as follows:

Best Refined, Nos. 26, 27 and 28.....	33¢
Best Refined, Nos. 18 to 25.....	31¢
Common, 4¢ less than the above.....	4¢ @ 5¢
Best Bloom Sheets, Nos. 22 to 25.....	41¢ @ 44¢
Best Bloom Sheets, Nos. 16 to 21.....	38¢ @ 41¢
Blue Annealed.....	2.6¢ @ 2.75¢
Best Bloom, Galvanized, discount.....	37½¢
Common, discount.....	62½¢

Steel Rails.—The feeling of firmness noted for some time past has developed into somewhat higher prices, \$35 being considered an inside figure at Eastern mills. Lower figures are not impossible if the order is a specially desirable one; but there is no doubt that prices are hardening. Prospects are said to indicate a demand equal to the fullest capacity of all the mills, so that there is no necessity for prices less than are now quoted; some think they will be higher toward spring.

Old Rails.—There is a pretty strong demand, but the supply is very light, and in most cases held at high figures. One cargo of Foreign sold at \$22.25 for shipment to a port on the Delaware, and smaller lots at \$22.25 @ \$22.50, Philadelphia. There are buyers at about \$22 for large lots, November or December shipments.

Scrap Iron.—The demand is improving, and with something of a scarcity prices are firm at about the following quotations: No. 1 Wrought Scrap, tidewater delivery, \$19 @ \$19.50; Selected do., \$20 @ \$21; No. 2 do., \$13.50 @ \$14.50; Turnings, \$14 @ \$14.50; Old Car Wheels, \$15 @ \$16; Old Steel Rails, \$20 @ \$21; Cast Scrap, \$14 @ \$15; do. Turnings, \$10 @ \$10.50; Fish Plates about \$25.

Wrought-Iron Pipe.—Notwithstanding the extraordinary business that has been transacted during the past few months the demand is still maintained. The mills have had all they could attend to for some months past, and judging from present appearances the demand is likely to continue well into 1887. Prices remain firm and unchanged.

Discounts as follows: Lap-Welded Black, 5½¢; Butt-Welded Black, 3½¢; Butt-Welded Galvanized, 2½¢; Lap-Welded Galvanized, 35¢; Boiler Tubes, 45¢.

Nails.—While the price of Nails remains the same as last quoted—\$2.20 from store—there appears to be a somewhat firmer feeling. Consumption is decreasing, while production is increasing, which will prove anything but beneficial to the market in its present state. We hear of several large mills who, rather than sell Nails at present prices, are stocking up and are not inclined to push trade to any extent. At outside points where Nails were sold the lowest there has been an advance of from 12¢ to 15¢; consequently houses having refused to sell at such ruinously low prices has had the effect of stimulating prices as above noted.

Pittsburgh.

Office of The Iron Age, 77 Fourth Avenue, Pittsburgh, Pa., November 9, 1886.

Now that the excitement incident to the recent election has about subsided people generally are giving less attention to politics and more attention to business. There is a good demand for all kinds of manufactured goods with the exception of Nails, orders for which nearly always fall off at this season of the year. The mills here and manufactories of all kinds are in operation, many of them running up to their full capacity, and labor, both of skilled and unskilled, is well employed, with a good prospect ahead. The cold snap of the past few days has increased largely the consumption of natural gas, and in several sections of both cities the supply is short, and there is a great complaint. The river Coal trade is in bad condition, and there will be no improvement until there is a rise in the river sufficient to let the Coal that is loaded out to the down-river markets. There is an immense quantity of Coal loaded, estimated all the way from 10,000,000 to 15,000,000 bushels; all the Coal landings from here down the Ohio River to the Davis Island dam, a distance of about 7 miles, are as full as they can be, and there is but little Coal mined for the want of empty craft to load it in.

Pig Iron.—There has been no material change in the situation since our last report; possibly there is less excitement, but the demand keeps up and the consumption here is as large as ever, reaching from 5000 to 6000 tons per day. Commission men continue to report that it is much more difficult just now to get the Iron to sell than it is to find buyers for it; there appears to be no falling off in demand either for present or future delivery. But very few of the furnaces here or hereabouts can make additional contracts for immediate or near-by delivery, being sold from one to three months ahead, and while it is true that a great many consumers have anticipated future wants, it is also true that there are buyers for all the Iron that is offered for sale. There has been but little Southern Iron offered here for some time, and private and reliable advices report that the Southern furnaces, like our own, are nearly all sold ahead, and have no Iron to sell. Prices continue strong, and some operators look for a still further advance, while others appear to think that the highest notch has been almost, if not altogether, reached. The demand for Foundry Irons is improving, although it is small when compared with that for Mill Irons. Quotations may be fairly given as follows:

No. 1 Neutral Forge.....	\$17.50 @ \$17.75, 4 mos.
No. 2 Neutral Forge.....	16.75 @ 17.00, 4 "
White and Mottled.....	15.50 @ 16.25, 4 "
All-Or Mill.....	18.00 @ 18.50, 4 "
No. 1 Foundry.....	18.50 @ 19.00, 4 "
No. 2 Foundry.....	17.00 @ 17.50, 4 "
Charcoal Foundry.....	20.00 @ 24.00, 4 "
Cold-Blast Charcoal.....	25.00 @ 26.00, 4 "
Bessemer Iron.....	19.75 @ 20.00, 4 "

There were sales of Bessemer Iron reported during the week at \$19.25 @ \$19.35, cash. Some of the knowing ones predict that Mill Irons will go to \$18 and Bessemer to \$20, cash, before the upward turn is arrested.

Muck Bar.—Continues firm, with a good deal of inquiry and but little offering. Sales reported at \$29.50 @ \$30.50, cash, according to quality, delivery, &c. The above quotations show an advance of from \$3 to \$3.50 per ton as compared with the lowest point, and it is claimed that it is still too low as compared with the cost of Pig Iron.

Manufactured Iron.—The activity noted for some time past continues, and prices for all kinds of Finished Iron are firm and tending upward, in sympathy with the enhanced cost of the raw material. We quote on a basis of 1.75¢ @ 1.80¢ for Bars for well-assorted orders, 60 days, 2¢ off for cash. Sales of Grooved Skelp Iron have been made at 1.85¢ @ 1.90¢. There is a continued good demand for Tank and Plate Iron, while the Bar trade is more active than it has been for a number of years.

Nails.—There is only a moderate business, although it is all possible that can be expected at this season of the year, as trade nearly always falls off in November. Prices firm but unchanged in carlots and upward: \$2 for Iron and \$2.10 for Steel, 60 days, 2¢ off for cash. The regular monthly meeting of the Western Association takes place at Cincinnati to-morrow, and an advance in prices is not improbable, as manufacturers almost without exception complain that they are too low. The Nail trade is the most unsatisfactory branch of the Iron business, and it may be attributed to the fact that the Nail-making capacity is greater than present requirements of the country. Zug & Co.,

have not run their Nail factory for over a year, and, with the exception of a few weeks in order to work up a few hundred tons of Nail Plate which they had on hand, that of Moorhead Bros. has been standing idle for several years. Jones & Laughlins are making a few Steel Nails for their Western houses; they are making no effort to sell in this market.

Wrought-Iron Pipe.—Notwithstanding the season is well advanced, the Pipe mills are as busy as they can be, and there is no doubt that this will continue to be the case until the close of the present year. No change in prices. Discount on Black Butt-Welded Pipe in carlots and upward, 40¢; Galvanized do., 30¢; Black Lap-Welded, 55¢; Galvanized do., 37½¢; Boiler Tubes, 47½¢; Casing, all sizes, 47½¢. Two-inch Tubing 16¢ per foot, net; 2 inch Drive Pipe, 14¢; 8-inch Drive Pipe, \$1.40.

Steel.—There is a continued good demand for all kinds of Merchant Steel, and prices are firm but unchanged. Best brands of Tool Steel, 8¢ @ 9¢ per lb.; Crucible Machinery, 3¼¢ @ 4¢; Open-Hearth do., 2½¢ @ 2¾¢. Bessemer Billets and Blooms in demand, with very few to be had, as the mills making them are sold ahead, and the same is true of Nail Slabs. Blooms and Billets may be quoted, in the absence of sales, at \$32 @ \$33 per ton. Crop Ends—none to be had; nominal at \$22.50 @ \$23; Bloom Ends, \$21.50 @ \$22. There was a sale of Foreign Crop Ends reported at \$24, cash, delivered in Pittsburgh.

Old Rails.—We can report a sale of 500 tons Old Iron Rails at \$25, deliverable in Pittsburgh, and another lot deliverable to a mill out in the valley at the same price. So far as we can learn there have been no sales above the price quoted, nor is it probable that any large lot could be sold, as the large consumers are pretty well supplied. Old Steel Rails continue very scarce, and in the absence of sales may be quoted at \$24 @ \$25 for long and \$22.50 @ \$23 for short lengths.

Steel Rails.—Heavy sections are now quoted at \$35.50 @ \$36, cash, at mill, for delivery in 1887.

Railway Track Supplies.—Prices are firm, but unchanged. Spikes, 2.40¢, 30 days; Splice Bars, 1.70¢ @ 1.75¢; Track Bolts, 2.75¢ with Square and 2.85¢ @ 3¢ with Hexagon Nuts. An advance soon is not improbable.

Old Material.—Of all kinds is in scant supply, and dealers continue to complain that prices here are low as compared with cost at sources of supply. Sales of No. 1 Wrought Scrap at \$20 @ \$20.50, net ton; Wrought Turnings, \$15 @ \$16; Old Car Axles, \$26 @ \$27; Cast Boring, \$12.50 @ \$13, gross ton; Old Car Wheels, \$17.50 @ \$18, gross; Open-Hearth Steel, mixed lots, \$21 @ \$22; sales for Crucible purposes at \$25 @ \$25.50.

Coke.—Blast-furnace Coke remains unchanged at \$1.50 per ton, free on cars at ovens.

Chicago.

Office of The Iron Age, 36 and 38 Clark St., Cor. Lake St., Chicago, November 8, 1886.

Trade in most branches of business was moderate last week, owing to the elections and the continued mild weather. Mail orders were less in number and light in volume from country merchants. Manufacturers received less new business than for several weeks previous. Collections were a trifle better than at the close of the month, but not nearly what they should be. The fresh outbreak of the strike among the employees of the meat packers of this city is detrimental to business in many lines, but has not been seriously felt in any particular direction. All classes of manufacture are complaining of their inability to obtain cars for shipping purposes. During the week the Calumet Furnace had to close down several days for the want of Coke, though they have about 100 cars on the way somewhere between Pittsburgh and Chicago, portions of which were expected Saturday. Railroads are overcrowded with work, and the closing of navigation this month is likely to still further encroach upon their carrying facilities. Additional orders for new cars have been placed recently, but manufacturers are far behind deliveries on previous orders. In all classes of manufacture there promises to be plenty of work during the entire winter.

Hardware.—Jobbers report that they have had a very good week's trade for the season. There has been a slight decline in the demand for some lines of goods, but increased on others. The mercury has fallen several degrees throughout the West, which has revived a general call for Stove Fixtures, Snow Shovels, Scrapers, Ice Tools, Lap Robes, Sleigh Bells, Sleigh Wood Stocks, Sleigh Boxes and Irons. All classes of dry wood material for wagons are very scarce and firm in price. Carriage Bolts have been advanced to 70 and 15¢ discount by jobbers. The market is reported firm and steady on the full line of Shelf Hardware, with some indications that higher prices will be adopted by manufacturers of specialties, to take effect after January 1.

Barb Wire.—The tone of the market has stiffened up very materially on the part of makers. Many of the manufacturers decline to take orders for immediate delivery at the

Merchant Steel.—There has been an increased demand for Spiral Spring Steel, Tool Steel of fine grade, Sheet Spring Steel and Steels for special work. The demand for Common Steels in regular shapes has fallen off a little in the past week. On high grades prices are firm, and on low grades unchanged from former quotations. Standard Tool Steels are quoted at 7½¢ @ 8¼¢; Spiral Spring Steel, 3¼¢; best grades of Bessemer, 3¢; Self-Hardened Steels (American), 40¢; Sheet Spring Steel, 8½¢ to 21 gauge; Crucible Machinery, round and flat, 4¼¢ @ 5½¢.

Scrap Iron.—Prices on Scrap continue very firm and the demand greater than the supply. No. 1 Forge is quoted at \$20.50 @ \$21; No. 1 Mill, \$16; No. 2, \$11; Cast Scrap, \$14.50, net; Car Axles, \$22.50; Horse Shoes, \$18; Stove Plate, \$9; Wrought-Iron Turnings, \$11.50; Cast Borings, Clean, \$9.

Chattanooga.

Office of *The Iron Age*, Carter and Ninth Sts.,
CHATTANOOGA, November 8, 1886.

facilities much dissatisfaction will exist, and it will act in some measure as obstacles to newcomers taking their chances with us. Another strain upon the business facilities of the South is the continued inadequate banking capital of the country. As is well known, when the fall approaches the cotton crop not only absorbs all the surplus that the banks may have, but also draws largely upon what otherwise would go toward the accommodation that ought to be extended to manufacturers on their short-time bills, and it is frequently the case that when applications are made for accommodation on such

Miscellaneous.—The new furnace to be built here is assuming shape, and the parties interested have organized and are now looking around for a location. They will prosecute the enterprise as fast as is practicable. It is intended to make a 100-ton furnace of it. The new Pipe works at South Pittsburgh for making Cast Pipe are progressing in their enterprise, and will in the near future commence their new buildings. The favorable arrangement which they have made with the furnace company for stock insures them all their Pig Iron at the minimum figure, and at the same time gives the furnaces as much for their product as though shipped to Northern points. At this place both the South Tredegar and Lookout mills are declining orders for Fish Plate, having as much booked as they care to enter at present. Fires in the Wrought-Pipe works were lit on Friday last and the machinery tested, and so far as discovered it worked with entire satisfaction. They expect to commence this week turning out Butt-Welded Pipe for the market. All the other industries of the district are running full and have more orders offered than they care to book.

Birmingham.

BIRMINGHAM, ALA., November 8, 1896.

Miscellaneous.—Chains are sold here two months ahead and Stoves almost six, and these facts may be taken as not more than a fair indication of the present state of things with the various iron-working enterprises at large. There is business here now for several more foundries and shops, and one or two of some size will probably be announced as definitely projected in a few weeks. Papers have already been filed for a shop, with \$25,000 capital, to make mainly a new rotary engine.

Cinnamati.

CINCINNATI, November 8, 1896.

Manufactured Iron.—A strong tone has prevailed, with further liberal orders for Floor and Plate, with full prices readily obtained. We quote Bar Iron, 1.65¢ @ 1.75¢; Charcoal Bar Iron, 2.65¢ @ 2.75¢; Sheet Iron, Boiled, Nos. 10 to 27, 2½¢ @ 3¢; Sheet Iron, Charcoal, Nos. 15 to 25, 2½¢ @ 4¢ 3d lb.

Cleveland.

CLEVELAND, November 8, 1896.

Iron Ore.—The market is comparatively inactive, but has all the elements of strength. Several sellers are holding lots of Ore ranging from 10,000 to 25,000 tons, for better prices. Some furnacemen predict a general shutdown as more likely to occur than any substantial increase in the prices now paid for Ores. It is said that 1000-ton quantities of Ore yielding about 60 per cent. of Iron were sold last week on a basis of \$4.92 $\frac{1}{2}$ ton in Cleveland. During the past week 19,150 tons of Ore were received in Cleveland for local use, and 27,000 tons were sent onward to the

Old Rails.—Holders are offering with more freedom. The demand is excellent, however, and prices range from \$22.75 to \$24.25 $\frac{1}{2}$ ton. Old Wheels are still quoted at \$17, although \$18 has been paid for a small order. All kinds of Scrap Iron are in good demand.

Louisville.

LOUISVILLE, November 8, 1886.

Pig Iron.—The market is very strong. Several large sales have been made at the advance of last week, and it is again becoming difficult to get orders booked at the advance. Every indication is that another advance of 50¢ or \$1 per ton will soon be made. With nearly every advance made during the last two months comes the report from Pittsburgh and other Eastern markets that it cannot be sustained, as the advance puts the price in Pittsburgh and these other markets just that much below local prices. But in each case it takes but a few days for Pittsburgh and other markets to respond. Eastern dealers seem to lose sight of the fact that advances in Iron rarely ever come from the large Eastern markets, but, on the contrary, generally, if not always, when of a permanent character, originate in the West. The Southern Irons are on the market now in nearly every State in the Union, and the Southern manufacturers consequently are in a better position to feel the actual pulse of the trade than even the larger Eastern districts, whose trade is confined to a smaller territory. We quote for cash in round lots:

Southern Coke, No. 1 Foundry.....	\$19.00 @	\$19.50
" " No. 2	18.00 @	18.50
" " No. 2½	17.50 @	18.00
Hanging Rock Coke, No. 1 Foundry.....	18.50 @	19.00
Hanging Rock Coke, No. 2	18.00 @	18.50
" " Foundry.....	21.00 @	22.00
Southern Charcoal, No. 1 Foundry	18.50 @	19.50
Silver Gray, different grades.....	17.00 @	17.50
Southern Coke, No. 1 Mill, Neutral	17.00 @	17.50
" " No. 2	16.00 @	16.50
" " No. 1 "Cold Short	16.50 @	17.00
" " Charcoal, No. 1 Mill.....	17.00 @	17.50
White and Mottled, different grades	14.00 @	15.00
Southern Car-Wheel, standard	25.00 @	26.00
" " " " " " " " " "	22.00 @	23.00
Southern Car-Wheel, other brands	24.00 @	25.00
Hanging Rock, Cold-Blast	24.00 @	26.00
" " Warm-Blast	21.00 @	22.00

Old Material.—The market for Old Material is fairly active; there is a good demand, as there usually is at this season of the year. Manufactured Iron is in good demand, and has an upward tendency. We quote for cash as below:

Rails, $\frac{1}{2}$ ton	\$22.10 @	\$23.00
Wheels, $\frac{1}{2}$ ton	15.50 @	16.00
No. 1 Wrought, $\frac{1}{2}$ 100	.85 @	1.00
No. 1 Country Wrought, $\frac{1}{2}$ 100	.75 @	.85
No. 2 Country Wrought, $\frac{1}{2}$ 100	.55 @	.65
No. 1 Cast, $\frac{1}{2}$ 100	.50 @	.60
Boilers, cut, $\frac{1}{2}$ 100	.65 @	.70
Boilers, uncut, $\frac{1}{2}$ 100	.45 @	.55
Flues, Tanks and Sheets, $\frac{1}{2}$ 100	.35 @	.40
Axles, $\frac{1}{2}$ 100	1.00 @	1.05

Wire—At last seems to be gathering a little strength. The mills are not pushing their product at concessions, as was the case a while back, and those who throughout the whole dry spell have been prophesying a pool insist still on the eventual fulfillment of their predictions. However that may be, it will be hard to realize anything between now and the latter part of December, when buyers naturally begin to feel about for their January wants. If any decided movement takes place we fancy it will be about that time.

Trade Report.

General Hardware.

The volume of business thus far during the present month has not been up to the more sanguine expectations, but prices as a rule are firm and show in certain lines a tendency toward advances.

NAILS.

The New York market continues quiet, without any change in the low values which have long prevailed. Cost is slowly but steadily advancing, and there is some uneasiness among the labor of the mills, due to the starting up of rolling mills long idle, whose complement of men must be collected by offering special inducements. This reacts upon the other works. We continue to quote \$1.95 to \$2 from store, with the ordinary abatement for carload lots on dock.

BARB WIRE.

Although it continues quiet, the New York market is a little stiffer, a small advance being insisted upon and generally conceded. This is due to the fact that the Chicago meeting of Barb Wire makers last week is reported to have made favorable progress toward the formation of a large pool on the basis of stock representation, with arrangements pending to allot product. Another point is the upward tendency of Plain Wire, caused principally by the higher price of Foreign Rods, and incidentally by the efforts to complete the arrangements for a pool. A meeting of the wire-makers was held to-day, at which an allotment was discussed to cover the make of Barbed Wire. It is the purpose of the Plain Wire makers to keep the output within the bounds of consumption, relying upon that method to lift the trade out of the demoralized condition in which it has been. We quote Barb Wire, in carload lots, 3.00¢ @ 3.95¢, some sellers asking 4¢ on the strength of the advancing tendency in Plain Wire.

MISCELLANEOUS PRICES.

The following are the revised and slightly advanced discounts for Wrought Iron Pipe:

	Carload	Less than
Butt-Weld Black.....	40	37 1/2
Lap-Weld Black.....	40	37 1/2
But-Weld Galvanized.....	30	27 1/2
Lap-Weld Galvanized.....	30	27 1/2

Farrington, Whitney & Sewell, 37 Warren street, New York, whose advertisement is on page 30, issue under date of November 1 a descriptive list of Hardware formerly made by Williams & White. It is announced that the manufacture of the Wrought Iron goods made by Williams & White will not be continued except as therein named. In issuing this circular they call attention to the fact that they are the proprietors of the entire line of patterns of Door Locks, Latches, &c., and have facilities for the manufacture of the various odd goods used by the trade, and not generally catalogued, which have accumulated in the above long-established business. The line of goods covered by this catalogue is indicated by the following discount sheet, giving prices under above date:

	Discount
Wrought Spring Gate Latches.....	40%&10
Mackrell's Oval Blind Fastenings, Japaned.....	60
Mackrell's Oval Blind Fastenings, Brass.....	60
M & R Old Pattern Blind Fastenings.....	50&10
Wrought Flat Blind Springs.....	50&10
Back Catches Nos. 1 and 2.....	50
Back Catches Nos. 5 and 6.....	50
Japaned Drops and Pins.....	70&10
Oyster Blocks.....	50
Horse Weights.....	50
Black Diamond Sheaves.....	50&10
School House Sheaves with Oiled.....	50&10
Wrought Sliding Door Rail.....	50&10
Cast Sliding Door Rail.....	50&10
Flush Handles for Sliding Doors.....	50
Acme Noiseless Sheaves.....	50
Peerless Dumb Waiter Pulleys.....	50
Champion Dumb Waiter Pulleys.....	50
Narrow and Wide Plate Dumb Waiter Pulleys.....	50
Dumb Waiter Cord Clamps.....	50
Champion Noiseless Window Pulleys.....	50
W. & W. Rim Sliding Door Latches.....	50

A slight advance during the past week has been made on the prices of Nuts and Washers.

There is little change to note in the Tin-ware market, which has been characterized by a good demand. Net prices are very frequently made representing a discount of from 30 to 50 per cent. from the list.

The market for Plain Wire is decidedly firm in view of the increased cost of the raw material and the efforts which are being made by the manufacturers to form an organization for the establishment of better prices, or the regulation of production, or both.

We hear that some of the larger jobbing houses are placing their orders for Scythes at prices somewhat better than those prevailing during the past season.

The irregularity in the prices of Wrought Butts continues, but the lower prices are becoming somewhat more general than they have been. The extreme figures at which the goods are now sold are perhaps lower than they have ever been. It is not unlikely that this competition may come to an end in a short time as the result of a better understanding among the manufacturers.

Some large orders for Handled Hoes have been placed by the jobbing houses at what are regarded as low prices, and several of the manufacturers have thus disposed of a good proportion of their production for the coming season.

Eye Hoes are held by the manufacturers firmly at somewhat advanced figures, and

there is little evidence of disposition to induce orders by concessions.

The low range of the prices of Locks as made by the associated manufacturers has the effect of interfering with the sales of some of the outside makers, who are not able to offer the usual concessions beyond association prices. These remain as they have been for some time, the regular printed price being nominal, and careful retailers having no difficulty in obtaining extras.

Padlocks are also low and irregular, with a wide departure from the regular printed prices.

THE SHORTAGE IN TACKS.

In the following letter, which comes to us from a well-known house engaged in the manufacture of Tacks, it will be seen that an indirect appeal is made to the jobbers not to call for Tacks put up in short and irregular weights. It will doubtless facilitate the continuance of such demand on their part if the retailers will be careful to scrutinize the Tacks purchased, whether from jobbers or manufacturers, and insist on having the correct weights. Our correspondents say:

We are very glad to add our commendation to others of your subscribers for the recent articles on "Short Weight Tacks." The method is pernicious, an injustice to the consumer, and a constant source of annoyance to the manufacturer who will not pack goods in that way. Our observations lead us to lay the blame of this condition of affairs at the door of the jobbers, as it is no advantage to the manufacturer to pack light weight Tacks, inasmuch as he is obliged to sell proportionately cheaper, while the retailer, and most surely the consumers, do not ask it. We have had inquiries from jobbers for Hungarian Nails packed eight weights, and know of these goods put up almost as light as eighth weight sold as full quarter by large and respectable jobbers. Steel Carpet Tacks, which when packed according to standard one would think light enough, having 2 ounces to the paper and 1 1/2 pounds to the dozen, we have been asked to pack 1 1/4 pounds to the dozen—a difference of 12 1/2 per cent. We have persistently refused to send out goods put up in this way or even to name prices. The result to us and other manufacturers who are doing the same is the loss of a large amount of business. If jobbers would ask for and take nothing but what is packed in the regular way the trouble would soon come to an end, and the prices become a little nearer uniform, even though they remain so very low that the largest business brings no profit.

Another manufacturer, referring to the matter, writes, under date October 27:

We thank you for calling our attention to a practice which alone can account for the extremely low quotations for Tacks. We do not believe that any manufacturer can sell at 80 to 90 per cent. off the Hardware list for Tacks, and make an honest delivery of the goods, without serious loss.

From letters received from Hardware men we make the following extracts:

Pennsylvania.—For the past year have bought all Carpet Tacks in bulk, as it is much more satisfactory to me and also to my customers, although it is more work to handle them. If I buy 25 or 50 pounds in bulk I know what I have, and am not so certain when the goods are bought in papers.

Mississippi.—We have received some short weight Tacks, but have had no trouble from them as yet. We received an extra 5 per cent. on them, but it does not compensate for the loss, and we now insist on full weights in buying.

Dakota.—We have not yet received any Tacks in short or irregular weights, and consequently we do not consider that the practice is carried to any extent. The effect with the trade in the West would be demoralizing to prices.

Missouri.—My experience in 22 years is that about one customer in four complains of "too much paper for the number of Tacks." My idea is that they should be put up in packages as uniform as are Screws, Bolts, Rivets, &c.

New Jersey.—We have seen short weight Tacks only in two cases—one a grocery store here, handling a few Carpet Tacks, and the other a carriage-maker, who bought some Tacks "extra low" of a Philadelphia drummer. We have none in our stock and do not want any at any price. We sell a large amount of Tacks to carriage trimmers and upholsterers, who would be very quick to notice any short weight. We have no idea to what extent the practice has been carried, never having had any offered to us as such.

North Carolina.—We have not to our knowledge come across any short weight Tacks. Early in the season we bought a large stock of Tacks from one of the leading old line manufacturers, and think they gave us regular weights, although we placed our order at a very low price. We think the short weight men should be discouraged as far as practicable.

Iowa.—We have not experienced much trouble with short weight Tacks until of late. On account of the low prices manufacturers must do it, however. We would rather see full weights and better prices.

Dakota.—In regard to the shortage in the weight of Tacks, will say I have not as yet found any complaint in that direction, but do not deny that there is a shortage made by some manufacturers. If such is the case I think it will be the means of raising prices on standard goods, and the consequence will be that when those manufacturers become known to the general Hardware trade they will have to come to standard weights and prices or step down and out. Such manufacturers should be published in the trade journals and circulars sent abroad.

Iowa.—It is my opinion that large quantities of Tacks are being put up in short and irregular weights, and the practice will continue and prices rule low until a better

understanding between manufacturers is reached or a new combination be formed.

Massachusetts.—I have found that none of the manufacturers put in any more than they are obliged to. In some cases the Tacks run considerably short. I bought a few cases recently by sample at reduced prices, and they were not over a third weight. I think that — are the most careful of any of the manufacturers, and I prefer to keep their goods on that account. Some years ago, when with a wholesale house, we used to put up Tacks for country trade in assorted boxes of 100 papers, and the Tacks used were ordered expressly for the purpose, being very light, but the house never had much complaint. I trust this matter of light weight will cause the manufacturers to look to their interests, and that in the future less of such goods will be put on the market.

Ohio.—After looking over your paper of the 21st I examined my Tacks in paper packages, and found them correct weight. In conversation with a commercial traveler yesterday, who represents a Hardware house in Cleveland, he said that short weight Tacks were sold by the jobbing trade at the present time, as they could be purchased at 10 to 20 per cent less than full weights. I will give my remedy for short weight Tacks: If a retail dealer in ordering Tacks from a manufacturer or jobber specifies standard weight Tacks, and the goods are sent short weight, box them and return same to the party from whom they were purchased. In that way the matter will soon regulate itself. I expect to pay the jobber or manufacturer a fair margin for his goods, but must insist on full weight and measure.

Colorado.—We handle —'s Tacks exclusively, and we have had a number of the packages weighed to-day and they hold up fully to the weight. We know, however, that other makers give short weights, and if we are not mistaken it has always been done in comparison with —'s weights, and of course the price is less and the consumer suffers.

Kansas.—I have not been troubled to any great extent, as I am buying almost exclusively the Steel Wire Tack. To avoid such annoyances I adopted this rule: Buy of responsible houses; be willing to allow them a fair margin and then accept nothing that is not standard of its class. A house readily learns what kind of goods their customers want, whether first or second class.

Ohio.—Our experience with Cut Tacks is limited. We use only Swedes Iron, half weight. We bought some Steel 1/4 weights, as we thought, a low price, but on weighing them find that 8 ounces are only 1 pound 5 ounces to the dozen instead of 24 ounces—that is, 3 ounces short. We find that Swedes Iron Tacks, 8-ounce, weigh 3 pounds to the dozen. These short weights have been sent all over. Every grocery, notion store and country store has them. We hear complaint also that there is too much paper for the amount of Tacks. This practice does not seem to affect the prices of single papers, but on dozen packages it does. The way the jobbers approach us in selling them is: "We have a fine bargain in Tacks—very cheap—10 per cent. lower than other people are selling—could not make such a price in less than case lots—standard goods—all right—but we bought the entire product of the factory," &c.

WHAT THE TRADE SAY.

William Blair & Co., Chicago, Ill., under date November 8, issue a price current showing a miscellaneous line of goods, including many seasonable specialties, and make the following remarks in regard to the market:

There has been a continuous good business in our line, without material variation, during the last month. The tendency of prices is upward, and advances made by the manufacturers have generally been held by jobbers.

Nails.—Both Iron and Steel Cut Nails are in good demand at present prices, and there is no accumulation of stocks. Wire Nails are held by manufacturers at \$3.55 in 25-kg lots. The production is constantly increasing, but at present it is difficult to get orders filled promptly at the mills. Our price will always be as low as any in this market. Barbed Wire seems to have touched bottom at last, and the manufacturers are looking for better prices before the next season opens. Black and Galvanized Iron are without change. Tin Plates.—It is poor economy to use the lower grades of either Tin or Roofing Plates. We carry a large stock of the best brands made of Bright Charcoal Tin Plates; also a heavy stock of reliable well-known brands of Roofing Plates. Our prices are as low as some of the inferior grades are sold in the market. In times of close competition, as at present, there is a tendency to run into lines of cheap goods of inferior quality. We maintain the high standard of our goods, as heretofore, and make our prices as low as any.

From Dudley Bros. & Lipscomb, Nashville, Tenn., we have the following advice, November 6:

Trade has suffered the past week from the usual stagnation in business attendant upon State or national elections. The tone of the market is healthy and the outlook is favorable, although our farming interests, especially newly-sown wheat, are suffering from the extremely dry weather. There has been no considerable change in values since July 1. Bar Iron has crept up \$2 per ton, and our Southern mills are full of orders. We hope to report an active winter business and better profits than we have been accustomed to the past four years.

ST. LOUIS AND WESTERN FREIGHTS.

The merchants and manufacturers of St. Louis have of late been consulting and moving energetically with a view to removing what they consider a discrimination against them in the matter of freights between St. Louis and certain Western points. The St. Louis Manufacturers' Southwestern Rate Committee have issued a circular giving a short history to show statistically that freights from that city on the different classes of goods are as follows, as compared

with those of Chicago, with the view to establishing the fact that the Southwestern Railway Association discriminate against St. Louis and in favor of Chicago:

	First class.	Second class.	Third class.	Fourth class.	Fifth class.	Class A.	Class B.	Class C & D.
St. Louis pays for 277 miles of short line Kansas City transportation, in cents per 100 pounds.....	\$0.70	\$0.55	\$0.40	\$0.30	\$0.25	\$0.25	\$0.22 1/2	\$0.18
Chicago pays for 488 miles of short line Kansas City transportation only, in cents per 100 pounds.....	\$0.90	.75	.50	.35	.30	.32 1/2	.29 1/2	.23
St. Louis-Kansas City rates per ton per mile are higher than those of Chicago by the following per cent.:	37	25.92	36.07	51.05	46.82	35.52	34.41	37.86
St. Louis is charged for 100 miles of short line Kansas City transportation more than Chicago is asked to pay for 100 miles like service between Chicago and Kansas City per 10 tons for 100 miles.....	\$17.26	8.97	8.39	7.33	7.19	6.17	4.06	3.57
The rate St. Louis pays to Kansas City, 277 miles, will carry Chicago goods destined to Kansas City the following distances from Chicago to Kansas City—miles.....	380	358	300	417	407	375	372	382
Notwithstanding St. Louis-Kansas City distance is but 57 per cent. of the Chicago-Kansas City distance, St. Louis is charged the following percentages of the Chicago-Kansas City rate—per cent.....	77.78	73.33	80	85.71	83.33	76.92	76.27	78.26

The following table of overcharges between St. Louis and Missouri River points are also given by those interested in this movement:

On goods destined to	First class.	Second class.	Third class.	Fourth class.	Fifth class.	Class A.	Class B.	Class C & D.
Kansas City and Western points basing thereon in Kansas, Colorado, Utah and New Mexico.....	27	19	13	13	10 1/2	9 1/2	8 1/2	7
Leavenworth or St. Joseph and Western points basing thereon.....	18	11 1/2	11	9 1/2	7 1/2	6	5 1/2	4 1/2
Atchison and Western points basing thereon.....	14	8 1/2	9	8 1/2	6 1/2	5	4	3 1/2

In order that this discrimination be removed the St. Louis houses interested in the matter have requested their Eastern correspondents who do business with St. Louis and along points west of St. Louis to aid in this effort to correct a condition of things which is alluded to as a growing evil, and one which has been an injury to St. Louis to an extent which it is difficult to estimate. They are bringing the matter to the attention of boards of trade, chambers of commerce and other trade associations, requesting them to take direct issue with the Southwestern Railway Association, which they refer to as overcharging business shipped direct from the Middle, Eastern and New England States to points on or west of the Missouri River, whether routed via Chicago, Toledo, Peoria or Bloomington, as shown in the following table, the overcharge being given in cents per 100 pounds:

On goods destined to	First class.	Second class.	Third class.	Fourth class.	Fifth class.	Class A.	Class B.	Class C & D.
Kansas City or Western points basing thereon.....	30 1/2	14	12 1/2	11	8 1/2	7	6 1/2	5 1/2
Leavenworth or Western points basing thereon.....	11 1/2	6 1/2	7 1/2	7 1/2	5 1/2	4	3 1/2	3
Atchison or Western points basing thereon.....	9	4	6	6	4 1/2	3	2 1/2	2 1/2
St. Joseph or Western points basing thereon.....	16	10	10	9	7	5 1/2	5	4

The St. Louis manufacturers and merchants, who appear to be taking hold of this matter with much earnestness, express the hope that the united action of the East and St. Louis will be sufficient to accomplish the desired change, as the coal, coke, live stock, lumber and wholesale merchants of St. Louis have started the ball rolling in their own interest. They refer to this discrimination as one against Boston and New York as well as St. Louis interests.

The following article from a recent issue of the St. Louis Globe-Democrat will be of interest as giving a history of the matter, and a view of the situation as seen from that standpoint:

After four days spent in vain over the problem of rates on Southern Kansas business, the representatives of the Southwestern roads have turned the matter over to arbitrators. It has been a long time since these gentlemen put in four days of hard work on a rate question without arriving at any settlement, and the very fact that they found it so difficult to arrive at satisfactory conclusions augurs well for St. Louis. A fair inference is that there is a fighting chance left for this city, and that is more than she had for a long time, while the throttling process has been going on.

The Southern Kansas rate question is only a modified form of the old fight between Chicago and St. Louis, at which this city was worsted years ago, and robbed of commercial territory which was hers by all the just laws of trade. Year after year St. Louis has protested feebly and ineffectually against a system of rates to Missouri River points which turned the traffic out of legitimate channels. Now by the extension of St. Louis railroads a new country has been opened up. By virtue of location this city should have sufficient advantage to hold her share of that trade, but it is proposed to extend the old system of Southwestern rates beyond the Missouri River and bring this new territory under their operation, thus depriving St. Louis once more of all advantage in location and the shorter route.

For the complete story of this high-handed robbery of trade territory it is necessary to go back to the time when Capt. Joe Brown was president of the Missouri Pacific. St. Louis then received all of the Kansas trade. There was no Chicago competition whatever. The first step taken was the building of the Cameron branch from the Hannibal and St. Joe to Kansas City, which let the Chicago, Burlington and Quincy into Kansas City. Then was the time for a far-sighted policy on the part of St. Louis. But none was adopted. Instead a course was pursued which virtually encouraged Chicago enterprise and made easy the robbery. The railroad magnates of St. Louis, with

their two roads running west to Missouri River points, sat quietly by and saw the Chicago, Burlington and Quincy enter Kansas City. Without appreciating that the situation called for any

action on their part they saw a rate made from Chicago to Kansas City which was the same as the rate from St. Louis to Kansas City, because the rate from St. Louis to Kansas City was large enough to satisfy the

carriers between Chicago and Kansas City. Chicago was 161 miles nearer the seaboard than St. Louis, and goods were put down there at from 4 to 6 cents cheaper than at St. Louis. Of course the Kansas trade felt the inducement. St. Louis merchants, paying more for their goods delivered from the East than Chicago did and paying the same to Kansas City that Chicago did, were put at a decided disadvantage. They tried in vain to meet this difference against them, and shaved their profits closer to keep the Kansas trade. And all the time the railroads from St. Louis to the Missouri River were run so as to perpetuate the disadvantage to this city.

One day St. Louis railroad men awoke to the fact that more Missouri River business was going to Chicago than was coming here, and that the proportionate amount hauled this way was decreasing yearly. It was a late awakening. Perhaps it would have been almost as well to have slept on. But there was a great stir. St. Louis mer-

chants are long suffering; but at last, provoked beyond endurance, they aired their grievances and the railroad managements were aroused to do something. But what a something it was! Instead of a fight to get back what was lost they were content with, as they thought, securing what remained, and how well that was done the present shows.

The result of the agitation was the formation of the Southwestern pool. Missouri River business was divided arbitrarily, 55 per cent. going to Chicago and 45 per cent. to St. Louis, which but a short time before had enjoyed the whole. And by the same iniquitous agreement St. Louis was allowed a rate of 25 cents a hundred on fourth-class freight to Kansas City, while the Chicago rate was 30 cents. In other words, the charge for hauling the 270 miles from St. Louis to Kansas City was fixed at 25 cents, while from Chicago to Kansas City, 487 miles, it was made 30 cents, both being rates which ignored the mileage basis, and were dictated by Chicago's commercial considerations.

Never was there such a scheme of discrimination planned and carried out in this country. To the shame of St. Louis and her railroad managers, it must be admitted that this scheme was not only put in operation, but has been kept in operation year after year. It was robbery of trade territory, but it was robbery from a great trade center with her eyes wide open and looking on. It was made successful only by the apathy of the merchants of St. Louis and the short-sighted policy of the managements of the railroads between St. Louis and Missouri. Grain, flour, packing, live stock, every branch of St. Louis trade, suffered, and untold millions have gone the way of Chicago which belonged to St. Louis. Can any one doubt what a different policy would have effected. The distance from Kansas City to the seaboard is 61 miles nearer by way of St. Louis than by Chicago, and yet, by reason of this grip Chicago maintains through the Southwestern pool, the rates are the same both ways, and St. Louis' boasted advantage of location is made a myth.

Ten years and more this city has been robbed by this discrimination, and now there is a determined effort being made, under the guise of an appeal for an arrangement of the rates on a mileage basis, to throw off the yoke. When the scheme went into operation neither seaboard, Liverpool nor any other points but Chicago, St. Louis and the Missouri River were taken into consideration, but now when a rearrangement is asked the argument in opposition to changes is that they would not be in harmony with seaboard rates from Chicago and St. Louis. Only the long-suffering merchants of St. Louis realize what this discrimination has cost the city. And now that it has become

so firmly established in its operation, only the stoutest hearted have much confidence in the movement to right the wrong. Once when Jay Gould was approached by St. Louis merchants to undertake the revolution against the Chicago tyranny, he shook his head, and, with a too-late expression, said:

"If you gentlemen desire to straighten this matter I will sell you the Missouri Pacific and retire. I found these rates established when I took the Missouri Pacific from St. Louis men, and I don't care to enter upon such a fight as you propose."

The renewal of the fight in behalf of St. Louis may seem to come after the great wrong has done its worst, but there is an aspect from which this reopening of the issues appears timely. Roads which have recently penetrated the Southern Kansas territory are now asked by the Chicago interests to make the same rate between St. Louis and Wichita direct as via Kansas City. In other words, the proposition is to extend the old robbing scheme in the interest of Chicago and to the harm of St. Louis beyond Kansas City, where it is now in full operation, to Wichita. If this can be forced upon St. Louis, then the recent extensions in Southern Kansas might as well not have been built, so far as St. Louis is concerned. In this fight Chicago is strengthened by having Kansas City an ally, for, of course, the latter city is interested in the Kansas territory, and a cheaper rate by the direct route between Wichita and St. Louis means disadvantage to Kansas City. There are millions in this Southern Kansas trade, but St. Louis has no interest in it whatever unless she can have rates on a mileage basis to Kansas.

ITEMS.

John S. Fray & Co., Bridgeport, Conn., issue a catalogue illustrating the Spofford Braces in the different patterns, and also the line of Hollow Handle Tool Sets which they are making, with the recent additions. Besides their No. 1 and 2, with which the trade have for some time been familiar, they have recently added their No. 3, which is a Screw Driver Set, which contains three Screw Driver blades of different sizes, the handle being made of cocobola or rosewood. It is listed at \$12 per dozen and subject to the same discounts as Nos. 1 and 2. The No. 4 Hollow Handle Set has also been added, being put on the market to meet the demand for a cheaper grade of goods than the regular Nos. 1, 2 or 3 Sets, which, it is stated, will be kept fully up to the present standard. The number and arrangement of tools in this No. 4 Set is the same as in their No. 1, and the list price is \$9 per dozen, the discount being the same as on the other goods. The list also describes their U. S. Scale, of which an illustration and list prices are given.

The Chieftain Hay Rake Company, Canton, Ohio, issue a new illustrated catalogue which is devoted principally to a description of their Chieftain Hay Rakes, of which the different styles are illustrated and many details given concerning their construction and operation. It also describes the Little Giant, Hercules and New Champion Post Hole Diggers and Kohler's Portable Tree Fence. Of the latter article a separate circular is also sent out with a special offer.

The Gibbs Saw Rake Company, Canton, Ohio, issue a new and attractive catalogue and price list showing their line of Lawn Rakes, Post Hole Diggers, Potato Hooks, &c. The aim of the company is stated to be to produce new and novel articles of unquestioned merit, and to this end they have largely increased their facilities by adding new and special machinery. It is also stated that their sales have increased sixfold the past year.

The Quincy Metal Wheel Company, Quincy, Ill., issue a catalogue explaining the construction and special features of the line of Wheels which they are making. It is explained that they are constructed with a cast-iron hub in one piece and wrought spokes and rim. The spokes, which are set staggered, are connected to the other parts of the Wheel by enlarged tenons, formed in their places by heavy pressure and while cold. This is referred to as the secret of the strength and durability of the Wheel.

The following extract from a recent Birmingham circular refers to the condition of trade in that market:

There is increasing activity in most of the Hardware branches, which are being benefited by the improvement in the metal market, and especially the recent rise in Copper, Spelter and Sheet Iron. There has been a large distribution of orders this week. Australian requirements are gradually expanding, and most of the South American markets are reported active. The United States market continues healthy and promising, and shipments to Canada and the markets of Northern Europe, though diminishing, are still considerable. In Galvanized Sheets there is a large business stirring just now both for home and export.

The imports of Hardware and Cutlery during the week comprise 113 packages, making a total of 5444 since January 1, as compared with 4866 for the same time in 1885.

Guhl & Harbeck, Hamburg, Germany, show in another column, page 30, an illustration of their Family Knife Polishing Machine, which they offer as an exceptionally useful machine for polishing Table-Cutlery, and one which will do this practically and easily and not ruin the Knives. The large and costly English machines which have heretofore been on the market were so difficult of management and so severe upon the Knives that they have never found a large demand in this country. The German machine is described as perfect in work-

manship, operating satisfactorily and intended for general family use. Further information in regard to it, either in regard to sales from stock or import orders, may be obtained at the New York office, the Francis T. Witte Hardware Company, 106 Chambers street, New York.

The F. F. Adams Company, Erie, Pa., have issued a revised catalogue of their manufactures covering their well-known line of Wringers, Ladders, Clothes Horses, Mouse Traps, &c. Most of the goods represented in it are included in their former list. There are, however, some additions, among which may be mentioned their Platform Truck, Hurley's Automatic Steam Flue Cleaner, the Jungbluth Lawn and Street Sprinkler and a new pattern of the Adams Cork Puller.

S. D. Pryce, Iowa City, Iowa, has sold out his business to Lichty & Adams.

The Lake Huron Stone Company, Detroit, Mich., and Chicago, Ill., whose announcement appears on page 31, in addition to their regular line with which the trade are familiar, are at present perfecting two new styles of Grindstone Frames, in the construction of which no screws, bolts or nails will be used, and which can be shipped knocked-down, occupying but very little space, and readily and quickly set up for use. These improvements are to do away with the objection to the mounted Stones on account of their being so bulky for transportation or storage. Referring to the indications as promising for the next year, they allude especially to the increase of their sale of Mounted Stones, and the fact that they have large stocks of their goods at Detroit and Chicago.

Coal Market.

It can hardly be said that prices of Anthracite are as firm as a week ago, the comparatively mild temperature prevailing not being conducive to an active demand. Stove Coal is weak, though one of the chief producers is represented as being unable to fill pressing orders. It is certain that supplies at Port Richmond have not accumulated. At the same time the talk about another advance has ceased. Nor is there now felt any deep concern about the proposed proceedings against the Coal combination. The Western demand continues good. The total amount of Anthracite coal sent to market for the week was 816,674 tons, compared with 894,324 tons in the corresponding week last year, a decrease of 77,650 tons. The total amount of Anthracite mined thus far in the year 1886 is 26,395,359 tons, compared with 25,625,279 tons for the same period last year, an increase of 770,080 tons. Quotations are as follows: Free-burning White Ash, Broken, \$3.55; Egg, \$3.80; Stove, \$4.15; Chestnut, \$3.65, and Pea, \$2.10. Pittston Broken, Egg and Stove are 10¢ to 15¢ lower, and Reading White Hard Ash Broken and Egg are 20¢ to 25¢ higher. Pea ranges from \$2.10 to \$2.30.

Bituminous Coal is without special feature, but is reported from week to week as being in better demand. The shipments from the mines of the Cumberland Coal region for the week ending October 30 were 70,761 tons, and for the year to that date 2,038,028 tons, a decrease of 267,120 tons as compared with the corresponding period of 1885. The Lehigh Valley Railroad, it is said, are seriously considering the subject of extending their system 250 miles westward from Ashland to a connection with the Pittsburgh and Western through a region rich in Bituminous Coal, and giving a new outlet for Anthracite Coal from the Lehigh and Shamokin valleys.

Metal Market.

Copper.—Our market has developed additional strength during the week, 11.90¢ being bid for spot Lake Superior. There are buyers and no sellers of November at 11.90¢, December at 11.95¢, January at 12¢, February and March at 12.05¢ to 12.10¢. For the moment the trade are expecting to hear the price of the Lake Superior mining combination for the new contract with consumers; 12¢ is expected to be the lowest price to be fixed, but some people think that the screw may be put on and the price be higher. Baltimore can be bought readily at 10½¢, with buyers at 10½¢ to 10.40¢. Export of Pyrites from Spain during the first eight months, 476,163 tons, against 574,743 in 1885 and 405,673 in 1884; of Ingot Copper, 17,781 tons, against 10,161 in 1885 and 11,162 in 1884. Export of Ingot Copper from the United States first nine months, 12,933,420 lb, against 30,288,527 in 1885. Best Selected declined 5/ in the London market and went off to 45.10/ while Chili Bars fluctuated as follows: November 4, £40.12/; November 5, £40.12/; November 6 and 8, £40.10/; November 9, £40.7/6; and November 10, £40.15/.

Tin.—We have again been under the influence of London manipulation. From £100.15/ the price was knocked down on the other side to £99.10/ yesterday, and as usual has recovered to £100. spot, today. Meanwhile our buyers have been enabled to pick up for shipment from London a further 250 tons at least at prices from 22½¢ net down to about 22¢ net, first cost. Should London feel disposed to part with a similar quantity again during the next 10 days buyers will be found among us. Spot Tin being scarce here, there are buyers at 22.15¢ @

22.20¢. Sellers are scarce at 22¼¢. Of futures, November-December deliveries have been taken at 22¼¢ down to 22½¢, quite freely. Import of Tin into the United States during the first nine months, 21,172,732 lb, against 16,785,818 in 1885; re-export, 142,923, against 57,963. Tin Plates.—There has been great steadiness noticeable in our market at the ensuing quotations for large lines, ordinary brands, per box: Charcoal Bright, \$4.75 @ \$5.37½; do. Ternes, \$4.25 @ \$4.50, and Coke Tin, \$4.50 @ \$4.62½. Liverpool is firm: Charcoal, 14/6 @ 16/6; Coke, 12/9 @ 13/6. Import of Tin Plates into the United States during the first nine months, 462,467,945 lb, against 397,380,869 lb last year; re-export, 1,661,320 lb, against 580,663.

Lead.—Since the rebound occurred last week there sold 200 tons Common Domestic at 4.45¢, and 200 tons at 4.50¢, at which figure the market closes firm pending further developments, although large consumers of Common Lead still hesitate about operating. The position of the metal is essentially strong on account of the great scarcity of Corroding Lead. Soft Spanish is worth in London £12.15, and English Pig £13. Export of Pig Lead from Spain during the first eight months, 75,106 tons, against 79,441 in 1885 and 75,595 in 1884.

Spelter and Zinc.—Nothing of special interest has occurred in Common Domestic Spelter, which moves off slowly at 4.30¢ @ 4.60¢ as to brand, whereas Silesian is worth 4½¢, nominally, having again improved in London to £14.7/6, which is an advance of 2/6 for the week. We quote Bertha Refined 8¢. Sheet Zinc is liberally taken at 5.52½¢ @ 5.60¢, Domestic. Export of Calamine from Spain during the first eight months, 20,335 tons, against 25,838 in 1885 and 22,975 in 1884. Export of Spelter in Pigs, Bars, Plates and Sheets from the United States, first nine months, 668,268 lb, against 67,947 in 1885.

Antimony.—The demand is moderate for the moment at 9½¢ Cookson and 7½¢ Hallett; the latter is worth in London £30, as heretofore.

Old Metals, Rags, &c.

The purchasing prices offered by dealers are as follows:

Heavy Copper	.....	@	\$0.06
Light Copper	.....	@	.07
Copper Bottoms	.....	@	.06
Brass, Heavy	.....	@	.06
Brass, Light	.....	@	.05
Composition, Heavy	.....	@	.05
Lead, Heavy	.....	@	.05
Tea Lead	.....	@	.05
Zinc	.....	@	.05
Wrought Iron	.....	@	15.00
Light Iron	.....	@	9.00
Stove Plate Iron	.....	@	9.00
Machinery Iron	.....	@	14.00
Grate Bars	.....	@	5.00
White No. 1	.....	@	.03
White No. 2	.....	@	.03
Canvass, Linen, No. 1	.....	@	.03
Canvass, Cotton, No. 1	.....	@	.03
Canvass, No. 2	.....	@	.03
Seconds	.....	@	.03
Soft Woollens	.....	@	.03
Mixed Rags	.....	@	.03
Gunny Bagging, No. 1	.....	@	.03
Jute Butts	.....	@	.03
Book Sticks	.....	@	.03
Newspapers	.....	@	.03
Waste Paper	.....	@	.03
Kentucky Bagging	.....	@	.03
Kentucky Bale Rope	.....	@	.03
Kentucky Bagging	.....	@	.03

Detroit.

CHARLES HEMROD & Co., dealers in Pig Iron, Detroit, Mich., report under date of November 8, as follows: Transactions during the week just past have been comparatively small, as manufacturers of Pig Iron, so far as our Michigan product is concerned, nearly all take the position that speculation at this time is going to be most profitable, and they prefer holding the larger part of their present make (for there are no accumulated stocks anywhere) themselves rather than put more than the actual present demands of customers are in their (the customers') hands. Every order for over 100 tons is cut down as far as possible. No sales are being made of Coke Irons, either. The buying must be shortly resumed, however, as stocks are in some cases getting very low, and then it is expected much better prices will be realized. There is no reason to doubt whatever that the present rise in prices is founded on the most healthy basis, viz., demand for consumption only and short supply. Old Material remains firm and hard to get, though we learned of one purchase of Old Iron Rails at a cut under our quotations, which are as follows:

Lake Superior Charcoal, all numbers	.....	@	\$21.50
Lake Superior Coke, All Ore	.....	@	20.50
Lake Superior Coke, Cinder Mixed	.....	@	19.00
Standard Ohio Blackband	.....	@	20.50
Southern No. 3	.....	@	19.50
Southern Silvery, Open	.....	@	18.00
Southern Silvery, Close	.....	@	17.25
Jackson County, Ohio, Silvery	.....	@	19.75
American Old Iron Rails	.....	@	25.00
Old Wheels	.....	@	18.75

St. Louis.

ROGERS, BROWN & Co., St. Louis, W. H. SHIELDS, manager, report as follows, under date of November 8, 1886: It cannot be said that the volume of business in this market for the past week has been large. Nearly all sellers are so completely run ashore on Iron to sell that the number of transactions is necessarily limited. The close of each week, however, witnesses a stronger situation in every respect than the preceding one, and the tendency of prices is steadily to advance. Bessemer Irons have advanced fully 3½¢ to 3¢. The advance of Southern Coke Iron has not been so great, but will amount to \$2.50 to 3¢. In Southern Car-Wheel Iron it will reach \$4 to 3¢, as compared with lowest prices of the year. Our largest foundries are running to their full capacity and melting Pig Iron in very large quantities. It is not expected that many orders will be placed during the present month. If much demand should spring

up it would carry prices to a higher level. The scarcity of Coke on account of lack of cars in the Connellsville district is beginning to embarrass the furnaces in this region. We quote for cash, f.o.b. cars St. Louis:

Charcoal Foundry	.....	@	\$19.00
Southern	.....	@	18.00
Coal and Coke Foundry	.....	@	19.00
Southern, No. 1	.....	@	20.00
Southern, No. 2	.....	@	18.00
Ohio Softeners	.....	@	18.00
Mill Iron	.....	@	17.00
Southern, No. 1	.....	@	17.50
Southern, No. 2	.....	@	16.50
Car Wheel and Malleable Irons	.....	@	23.00
Lake Superior	.....	@	22.00
Scrap, &c.	.....	@	17.50
Old Rails	.....	@	22.00
Connellsville Coke (Frick's)	.....	@	5.65

Baltimore.

W. N. WYETH, Iron and Steel merchant, 46 and 48 South Charles street, reports us the following, under date of November 8: The past week has been a very active one in iron circles here. There has been experienced a great difficulty in obtaining supplies as rapidly as the trade would desire; hence there is much complaint on this account. Prices rule very firm, and doubtless this week will develop an advance, there being a sufficient reason for same; indeed it was practicable late last month. We quote the market very firm and active:

Ref. Bar Iron, 1 to 6 x 3/4 to 1 1/2	.....	@	2.10¢
" 1 to 4 1/2 x 1 1/2 to 1 1/2	.....	@	2.10¢
" 3/4 to 2, Round	.....	@	2.10¢
And Square	.....	@	2.10¢
Hoop Iron, 1 1/2 wide and upward	.....	@	2.40¢
Band Iron, from 1 1/2 to 6 in. wide	.....	@	2.35¢
Horse Shoe Iron	.....	@	2.35¢
Norway Nail Rods	.....	@	2.45¢
Black Diamond Cast Steel	.....	@	10¢
Machinery Steel	.....	@	4 1/2¢
Spring Steel	.....	@	3 1/2¢
Common Horse Nails	.....	@	8¢
Railroad Spikes, 5 1/2 x 3 1/2	.....	@	3 1/2¢
Perkins' Horse Shoes, 9 keg of 100 lb	.....	@	4.85¢
" Mule Shoes	.....	@	4.85¢
Boiler Tubes	.....	@	47 1/2¢ off list

Imports.

The following were the Imports of Hardware, Iron, Steel and Metals into the Port of New York for the week ending November 10, 1886:

Hardware	.....	@	32
Baker Hermann & Co.	.....	@	32
Mdse., cs.	.....	@	4
Cases, 5	.....	@	4
Clark & A. & Bro.	.....	@	30
Mach'y, cs.	.....	@	30
Cleveland A. B. & Co.	.....	@	30
Mach'y, case, 1	.....	@	30
Curtis R. J. & Co.	.....	@	30
Curley J. & Bro.	.....	@	30
Cutlery, pkgs., 8	.....	@	30
Darrell J. W.	.....	@	30
Largo guns, 2	.....	@	30
Chains with hooks, 2	.....	@	30
Field Alfred & Co.	.....	@	30
Cases, 5	.....	@	30
Guns, cs., 16	.....	@	30
Packages, 4	.....	@	30
Mdse., cs.	.....	@	30
Foley Ed.	.....	@	30
Mach'y, pkgs., 84	.....	@	30
Gerdan Otto	.....	@	30
Packages, 109	.....	@	30
Gorham Mfg. Co.	.....	@	30
Packages, 2	.....	@	30
Hartley & Graham	.....	@	30
Mdse., cs., 18	.....	@	30
Mdse., cs., 18	.....	@	30
Harlan & Hollingsworth	.....	@	30
Wheels, 8	.....	@	30
Hayley E.	.....	@	30
Cases, 4	.....	@	30
Folsom H. & D.	.....	@	30
Arms, cs., 5	.....	@	30
Huben J.	.....	@	30
Arms, case, 1	.....	@	30
Lau J. H. & Co.	.....	@	30
Arms, cs., 3	.....	@	30
Rosenthal J. & Co.	.....	@	30
Cases, 2	.....	@	30
Sellers W.	.....	@	30
Mdse., cs., 2	.....	@	30
Sussfeld, Lorach & Co.	.....	@	30
Packages, 2	.....	@	30
Schoverling, Daly & Co.	.....	@	30
Gales	.....	@	30
Mdse., cs., 17	.....	@	30
Guns, 2	.....	@	30
Strauss, Blumenthal & Co.	.....	@	30
Case, 1	.....	@	30
Simmons, S. & J. E.	.....	@	30
Mach'y, cs., 7	.....	@	30
Star Union Line	.....	@	30
Case, 1	.....	@	30
Taylor & Bros.	.....	@	30
Cases, 3	.....	@	30
The F. T. Witte Hardware Co.	.....	@	30
Cases, 6	.....	@	30
Walker P.	.....	@	30
Mach'y, case, 1	.....	@	30
Wells, Fargo & Co.	.....	@	30
Arms, case, 1	.....	@	30
Wiebusch & Hilger	.....	@	30
Mdse., cs., 21	.....	@	30
Witte John G. & Co.	.....	@	30
Cutlery, cs., 7	.....	@	30
Order	.....	@	30
Nails, drums, 33	.....	@	30
Mach'y, cs., 23	.....	@	30
Arms, cs., 19	.....	@	30
Cutlery, case, 1	.....	@	30
Mach'y, pcs. and pkgs., 180	.....	@	30
Cases, 4	.....	@	30

Iron	.....	@	21.50
Baring Bros. & Co.	.....	@	21.50
Wire rods, coils, 9755	.....	@	21.50
Nail rods, bbls., 2798	.....	@	21.50
Bundles, 327	.....	@	21.50
Bars, 1947	.....	@	21.50
Ore, tons, 298	.....	@	21.50
Brandenburg L. E.	.....	@	21.50
Anchor, 2	.....	@	21.50
Chains, fathoms, 200	.....	@	21.50
Old Iron, tons, 5	.....	@	21.50
Crocker Irons	.....	@	21.50
Spiegel, tons, 401 1/2	.....	@	21.50
Downing R. F. & Co.	.....	@	21.50
Girders, 240	.....	@	21.50
Pigs, 154	.....	@	21.50
Drexel, Morgan & Co.	.....	@	21.50
Pigs, tons, 768	.....	@	21.50
Feuchtwanger L. & Co.	.....	@	21.50
Ferromanganese, cs., 25	.....	@	21.50
Freres Lazard	.....	@	21.50
Rods, coils, 10,523	.....	@	21.50
Geisenheimer & Co.	.....	@	21.50
Ferromanganese, cs., 86	.....	@	21.50
Morton, Bliss & Co.	.....	@	21.50
Galv. wire, cs., 38	.....	@	21.50
Naylor & Co.	.....	@	21.50
Spiegel, tons, 180	.....	@	21.50
Perkins C. L.	.....	@	21.50
Ferromanganese, tons, 641	.....	@	21.50
Patton, Vickers & Co.	.....	@	21.50
Castings, case, 1	.....	@	21.50
Pin, Forward & Co.	.....	@	21.50
Galv. iron, bbls., 30	.....	@	21.50
Rupert's Brewery	.....	@	21.50
Wire, cs., 3	.....	@	21.50
Sheldon Geo. W. & Co.	.....	@	21.50
Castings, case, 1	.....	@	21.50

The imports at this port of Hardware Cutlery and Metals during the week ending November 5 were as follows:

	Quantity.	Value.
Brass goods	37	\$3,289
Bronzes	39	3,070
Chains and anchors	5	245
Clocks	102	12,341
Copper	.....	0,035
Cure	103	10,300
Dutch metal.	20	2,816
Guns	143	20,340
Hardware	10	817
Iron, pig, tons	1,409	15,736
Iron, cast, tons	3	30
Iron, spigot, tons	3,072	80,764
Iron ore, tons	197	437
Iron, tubes	322	351
Iron, other, tons	1,452	34,129
Lead	15	1,070
Metal goods	486	33,191
Needles	15	4,427
Nickel	5	1,299
Old metal	.....	16,341
Patina	.....	14,343
Refractory antimony	140	5,786
Saddlery	15	1,743
Steel	52,857	192,481
Spelter, lb.	116,257	4,296
Tin, slabs	.....	9,756
Tin, bars, 11,742	lb	1,141,050
Wire	43	9,757
Zinc, lb.	12,083	455
Zinc, oxide	300	2,405

L. COES'
GENUINE IMPROVED
Knife Handle
PATENT
Screw Wrenches
MANUFACTURED BY
L. COES & CO.,
Worcester, Mass.
ESTABLISHED IN 1839.




Patented July 6, 1880. Patented July 8, 1884.
Registered March 31, 1874.

Sectional view illustrates our NEW KNIFE HANDLE, showing Malleable Iron Frame and Shank of Bar keyed into position.
Straight Bar, Extra LONG NUT FOR SCREW IN JAW.

The Best Made and Strongest Wrench in the Market.
Send for Illustrated Price List and Circular.

J. C. McCARTY & CO.,
NEW YORK.
Sole Agents.

ILLINOIS IRON & BOLT CO.,

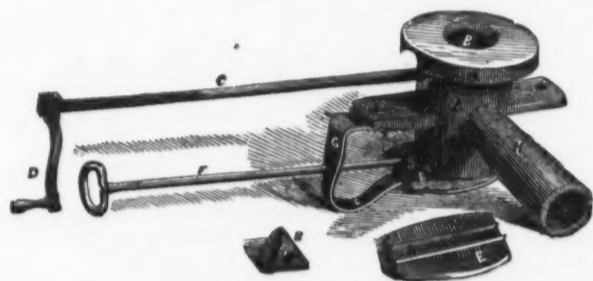
Nos. 20 to 26 Main Street,

CARPENTERSVILLE, KANE CO., ILL.

MANUFACTURERS OF

NORTON'S PAT. TUYERE,

Blacksmiths' Tools,



Thimble Skins,

BLACKSMITHS' DRILLS,

Jack Screws, Tire Benders, Track Jacks,
Carriage Makers' Vises,

SAD IRONS, COPYING PRESSES AND STANDS, &c.

American Manufacturing Company,
PHILADELPHIA,



MANUFACTURERS OF THE
ONLY PERFECT ADJUSTABLE
Sliding Door Hangers,

ONLY PERFECT
TRANSOM LIFTER,
ADJUSTABLE SAW VISES, SPOKE
SHAVES, SPOKE TRIMMERS,
BENCH HOOKS, HOLLOW AUGERS,
EXCELSIOR CAN OPENERS,

Patent Braided Cotton
CHALK LINES, &c.
FOR SALE BY

LLOYD & SUPPLEE
HARDWARE CO.,
PHILADELPHIA.



Parlor Door Hanger.

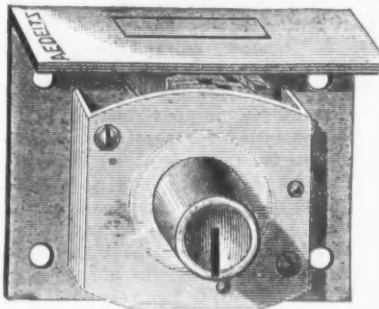


**"FLORENCE"
LAMP STOVE.**
Well Advertised,
Sells Quick and
Pleases Everybody.
Why not try them?
The ALFORD & BERKELE CO.
Selling Agents,
Pat. Nov. 14, 1876, & July 11, 1882. Others Pending.
77 Chambers St., New York.



Moss & GRAVING CO.
335 PEARLY
NEW YORK
OUR SPECIALTY: FINE ILLUSTRATED CATALOGUES
BY OUR NEW MESSING PROCESS.
Send Green Stamp for Mosaic Specimens.
ORE JIGS.
The attention of Hematite ore miners is called to our new Jig. The simplest and most effective separator now in use.
MCLANAHAN & STONE,
Gaysport Foundry, Hollidaysburg, Pa.
Manufacturers of Ore Washers, Screens, Elevators, Conveyors, and general Ore Mining Machinery.

A. E. DEITZ. GOODSELL LATHE.



No. 51 Lock.

J. C. McCARTY & CO., Agents,
97 Chambers and 81 Reade Sts.,
NEW YORK.



W. & J. TIEBOUT,
MANUFACTURERS OF
BRASS, GALVANIZED & SHIP CHANDLERY
HARDWARE.
Nos. 16 & 18 Chambers Street,
NEW YORK.



ALWAYS GIVES THE
UTMOST SATISFACTION.

Main Belting Co.,
Manufacturers of
**THE LEVIATHAN
COTTON
BELTING.**

Unsurpassed for
Strength, Durability and
Cheapness.
Made to any length,
width and strength.
Main Driving Belts.
Guaranteed to Run
Straight, Even Through-
out.
No Cross Joints, Un-
affected by Damp-
ness, Clings well to the Pulley.
Has no equal. In fact,
is THE BELT.

**MAIN BELTING
COMPANY,**
S. W. cor. Ninth and Reed
Sts., Philadelphia.
Also
248 East Randolph St.,
CHICAGO.

THE CHAMPION LEVER BLOWERS & FORGES

Are the Leaders of the World.



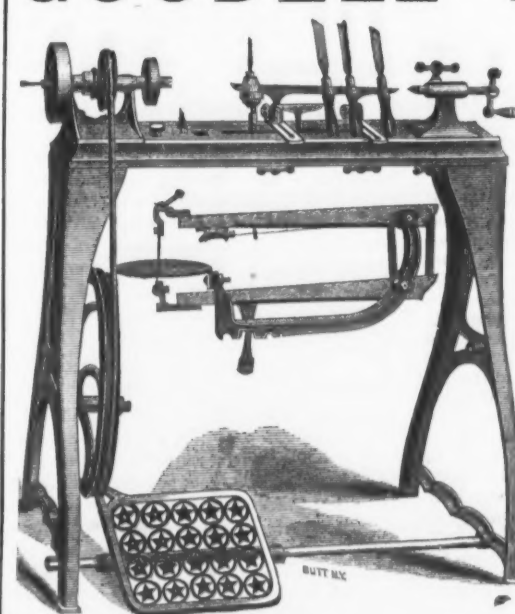
An entirely
novel construction.
"They have
no equal." No
Cog Wheels, Rat-
chets, Pawls,
Gum Balls or
other Friction
Devices to wear
out in a short
time. Easy Mo-
tion. Powerful
Blow. Noiseless
and Durable.
Guaranteed to
give entire satis-
faction. Write
for catalogue and
prices.

**CHAMPION
BLOWER &
FORGE CO.,**
Corner
Cherry & James,
LANCASTER, PA.

WHITE MOUNTAIN FREEZER.



AXLEINE
is a fine quality of Axle Grease, put up in square
tin boxes containing one pound, beautifully de-
corated in assorted colors, designed especially for
the Hardware Trade. Showy and attractive shelf
goods. Send for sample and prices.
LOVELL, TRACY & CO.,
71 Asylum St. Hartford Conn.



Many kinds of Scroll Saws have
been put on the market by our-
selves and other manufacturers
during the past twelve years. Of
these only a few have proved good
enough to remain in demand. The
call now is for a well-made, prac-
tical machine, and all second-class
ones are of no use.

Those who want a good Lathe
with Scroll-Sawing Attachment and
all Tools and Improvements to the
very latest moment will buy the
Goodsell Lathe.

Those who want only a Scroll Saw
with Drilling Attachment, Rubber
Blower and Lever Clamp will pre-
fer the Rogers saw.

These two machines are taking
the place of all others and are now
the most in demand throughout the
world.

No dealer can make a mistake by
laying in a stock of them. About
Christmas time they are wanted
in every town, and will make busi-
ness lively at this otherwise dull
season.

We also keep a full stock of
Designs, Wood, and all other Scroll
Sawing goods.

Price of Goodsell Lathe,
complete, \$12.00.
Price of Rogers' Saw,
complete, \$3.50.

MILLERS FALLS CO.,

74 Chambers Street, New York.

CHAMPLAIN
Forged Horse Nails.
MANUFACTURED BY THE
NATIONAL HORSE NAIL CO.,
Vergennes, Vermont.
HOT FORGED AND COLD HAMMERED POINTED. MADE OF BEST
NORWAY IRON AND WARRANTED.
WAREHOUSE
97 CHAMBERS AND 81 READE STREETS NEW YORK.
J. C. McCARTY & CO. Sole Agents.

H. B. SEIDEL, President. W. HASTINGS, Vice-Pres. and Gen'l Mgr. E. T. CANBY, Sec. and Treas.

THE SEIDEL & HASTINGS CO.,

WILMINGTON, DELAWARE,

New York Office, No. 221 Pearl, Corner Platt Street.

MANUFACTURERS OF

BEST CHARCOAL BOILER PLATES, AND PLATE IRON GENERALLY.

ALSO BEST QUALITY HOMOGENEOUS STEEL PLATES.

We ask the special attention of the trade to our C. H. No. 1 Boiler Plates, which we
manufacture expressly for the Shells of Steam Boilers and stamp 50,000 pounds T. A. when
desired. One hundred and sixteen tests of this iron, made during the last three years by the
U. S. Inspectors of Steam Vessels, show an average tensile strength of 58,808
pounds to the sectional square inch, and an average reduction of area of the fractured
section of 30% per centum. Our prices are as low as the production of a good article will admit of.

POTTSVILLE IRON & STEEL CO.,

POTTSVILLE, PA., Manufacturers of all kinds of

STRUCTURAL STEEL AND IRON

Viz., BEAMS, CHANNELS, TEES, ANGLES, PLATES AND BARS; Also STEEL
AND IRON AXLES FOR FREIGHT AND PASSENGER CARS.

This Steel is manufactured by the CLAPP-GRIFFITHS process, and is specially adapted, in
addition to the above, for Boiler and Bridge Rivets, Wire Rods, Nail Plates, &c. &c. Our Mill Steel
is well adapted for use in place of the best quality of Wrought Iron; where a greater strength
and ductility is required, it welds readily as iron. Also Billets, Slabs of all sizes and any desired
temper. Shaping of all sizes in stock, from which prompt shipments can be made.

Brewery, Malt and Ice House Construction a Specialty.

Hermann-Parker Hardware Mfg. Co.,

MANUFACTURERS OF

GREY IRON SHELF HARDWARE.

Our Specialties: Axle Pulleys, Well Wheels, Grind-
stone Fixtures, Hay-fork Pulleys, Wash-boiler
Handles, Stove Lifters and Post Mauls.

Works: 11th and Papin and 12th and Gratiot Streets, St. Louis.

PURE TURKISH EMERY. WALPOLE EMERY MILLS,

South Walpole, Mass.

MECHANICAL.

Machine for Turning and Truing Grindstones.

The truing of a grindstone is usually a disagreeable operation which is often neglected. The machine which we illustrate in the annexed cuts, and which is built by London, Berry & Orton (Atlantic Works), of Philadelphia, will therefore be found a welcome means of going through this operation. The stone is not bruised off, but is cut by a chilled disk driven by the motion of the stone itself. The machine can be

whatever velocity is due to its head; but suppose, instead of removing the plug, we bore a hole through it of one-half the area of the pipe, the water will descend with only one-half of the former velocity. A turbine-wheel works precisely upon this principle; the shutters and buckets represent a tube that is always filled with water; the gates represent the opening in the top, and the power utilized from a given amount of water under a given head depends upon the velocity with which that column of water descends. If the shutters and buckets are in proper proportion the highest results are obtained. The various manufacturers of turbine-wheels have experimented upon various curves and

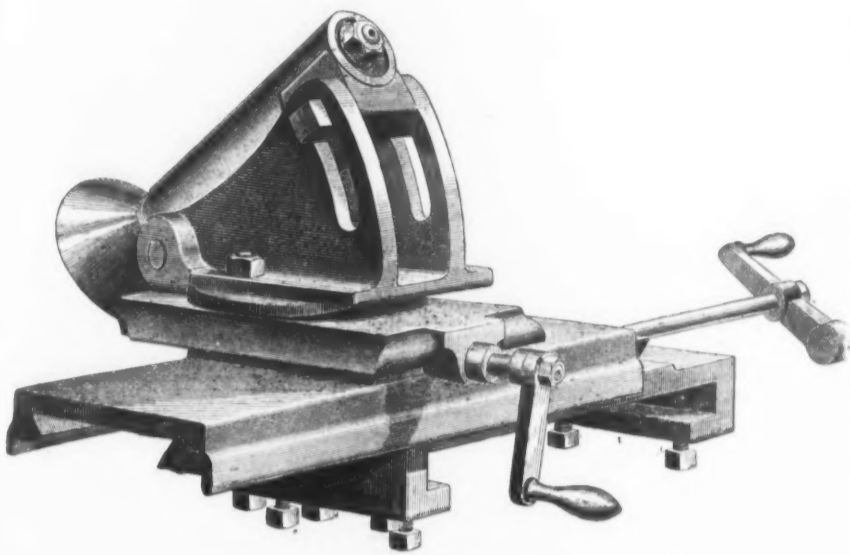


Fig. 1.—Perspective View.

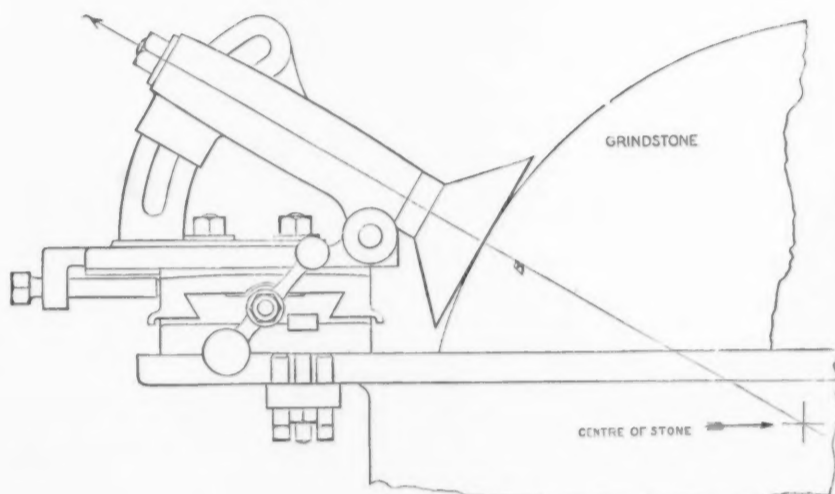


Fig. 2.—Showing the Correct Position of the Cutter.

GRINDSTONE TRUING MACHINE. BUILT BY LONDON, BERRY & ORTON, PHILADELPHIA, PA.

attached to any grindstone frame, and should be placed as shown in Fig. 2, with the axis A B of the cutter pointing toward the center line of the stone. The cut should be started in from each edge of the stone, meeting in the middle of the face of the stone, and will thus prevent breaking down the edges of the stone. The stone is run in water while being cut, avoiding all dust, and the whole operation occupies from five to fifteen minutes. The chilled disks are very durable, and can be renewed at very little expense.

Turbine Efficiency.

A correspondent of the *Paper Trade Journal* in a recent issue writes:

The experiments of the best hydraulic engineers, both in France, England and the United States, of such men as Morin, Emerson, Francis and Webber, have shown, and all agree in their reports, that the average turbine-wheel, with full water, will return a useful effect of from 75 to 85 per cent., while the same wheel with half water will not give more than from 40 to 45 per cent. of the same. To get the best results the gate, shutters or guides that admit the water to the wheel should be so proportioned that the water may strike the wheel in a direction opposite to the curve of the buckets, and deliver to the wheel just as much water as the wheel will discharge, and no more. Then both the forces of percussion and reaction will be brought into requisition. The water from the shutters will impinge upon the bucket, and the force of percussion is here obtained; as the direction of the water is changed so as to enter the wheel in an opposite direction, the force of reaction is brought into requisition, and, if the wheel is properly constructed and running at a proper speed, by the time the water is discharged its force should be nearly spent, and, instead of spurting from the wheel, it should be dropped into the pit nearly in a perpendicular direction and with no more velocity than is necessary to get rid of it. If, on the other hand, the shutters, gates or guides are so large that more water will be admitted than can be discharged, the force of percussion is lost just in proportion to the quantity of water, and such wheels work mostly by reaction. The same thing is true if the shutters are too small and less water is admitted than the wheel can discharge; the water impinges upon the bucket, but, as the quantity is less than the wheel requires, it passes through it with less velocity, and the full force of reaction is not obtained.

To illustrate this we will suppose a pipe, say, 4 inches in diameter and 10 feet long, to be filled with water, the upper end plugged up so as to exclude the air, and the lower end immersed in standing water. The consequence is the water will remain in the pipe. Now, if the plug is removed so as to admit the air the water will descend with

forms until it would seem that as great a percentage of useful effect from a full column of water has been obtained as is possible, but after all the loss of power at partial gate, which operates the same as boring a small hole in the plug referred to, is yet a serious detriment to the best of turbines. Experience has proved that if a wheel using 1000 cubic feet of water per minute will give 80 or 85 per cent. of useful effect the same wheel, with 500 cubic feet, will not give more than 40 to 45 per cent. of the same. If the first wheel be replaced by one of just sufficient capacity to use 500 cubic feet the same percentage of power will be obtained as in the former case with the larger wheel.

Ice Machinery and Refrigeration.

The rise and progress of the ice machine and refrigerating apparatus is one of the most remarkable features of present machine practice. There are only two varieties—those of compression and absorption. In compression practice the competition is not even surpassed by the steam engine. The surprise at the variety of names, manufacturers and titles is only met by that at the very small difference in the details of construction. Each of the constructions are exhibited as far superior and more economical than any other, and yet no data are presented to enforce such claims. Comparing the two independent methods of compression and absorption, we have the value of the first based upon high-priced and expensive compressors and engines, that of the second simplicity of construction and quietness of operation. While in the first case lofty or widespread (and we might say noisy) plant displays itself as a work of art in machinery practice, in the second massive construction and quiet operation attract the attention and give rise to the question as to whether the plant is operating at all. A specially bad feature of the compression system is the necessity for duplicate plant consequent upon the great liability to a break-down, due to the extremely trying work coming upon the machinery of this system. No matter how small the plant, duplicate compressors and engines are an admitted necessity. In the face of this extra expense, however, machinery is cheaper than ice itself.

Increasing the Valve Travel in Locomotives.

The *National Car and Locomotive Builder* in its last issue says: "A tendency is apparent of late among designers of locomotives to increase the throw of eccentrics and the travel of the valve. Only a few years ago 4½ inches eccentric throw and the same valve travel were common and favorite dimensions. Last month we mentioned that Mr. Soule, of the Erie, was trying an eccentric throw and valve travel of 6 inches on some new engines under construction. Since

then we have ascertained that several roads have adopted an eccentric throw of 5½ inches for all their passenger locomotives. In early designs of link motion the slip of the link block was made out to be a great evil that must be reduced by every possible means to its lowest possible limits. To lessen the slip many motions were designed with short eccentric throw. Experience has, however, proved that a little slip is not so objectionable as the restricted valve opening entailed at short points of cut-off by a very limited valve travel. Besides giving a better opening at short points of cut-off, a valve motion with a fairly long valve travel is easier kept approximately square than a short throw valve when the working parts get worn."

Steel for Boiler Plates.

The Committee of Lloyd's Registry for British and Foreign Shipping, having been advised by their technical engineering staff that it was fitting that there should be greater stringency as to the tests to which steel for boilers is subjected, have issued modified instructions on the subject. Formerly all steel for boiler plates was required to have an ultimate strength of not less than 26 and not more than 30 tons per square inch of section, with an ultimate elongation of not less 20 per cent. in a length of 8 inches. In the matter of elongation their requirements remain the same, but as regards the breaking strain a sliding scale is adopted, as follows: The material of stays and of plates not exceeding 1 inch in thickness is to have an ultimate tensile strength of not less than 26 and not more than 30 tons per square inch of section. In plates above 1 inch and not more than 1½ inches in thickness the ultimate strength must not be less than 26 and not more than 29 tons per square inch, and in plates above 1½ inches in thickness not less than 26 tons and not more than 28 tons per square inch. Previously the temper test was only applied to samples taken from every plate intended to be used in the furnaces and combustion chambers, but in future it is to be applied to samples taken from every plate intended to be used in the construction of boilers. It may be expected that this increased stringency may produce better results in steel, but would it not be advisable to limit the breadth and area of steel boiler plates? So far as we can gather from a careful consideration of this important matter there is a great danger in large steel plates being unreliable, through irregularity in cooling causing local defects. For iron and steel vessels Lloyd's Register apparently views with suspicion the use of very broad shell plates, and some time ago practically prohibited the use of plates over 4 feet 6 inches in width. Is there not much greater reason to object to wide boiler plates?

The Clayton Pneumatic Pressure Relief Governor.

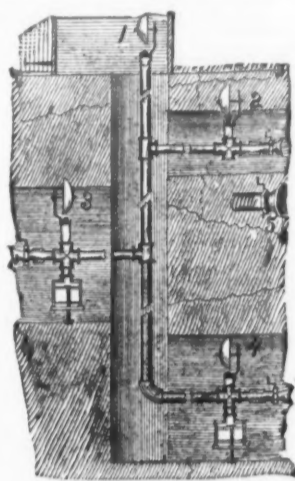
The Clayton Steam Pump and Air Compressor Works, of Brooklyn, N. Y., are furnishing their pumps and compressors with a newly designed relief governor, of which we annex a cut. The governor is designed to relieve an air compressor or pump worked by belt-power, or otherwise than by steam direct, from the power used in compressing the air when it would otherwise compress more air than is wanted for working purposes. The saving of power thus effected is sometimes very considerable. The whole arrangement, as the cut explains, consists in having a horizontal branch-pipe attached to the upright discharge-pipe E. In this branch is a relief-valve, B, worked by the rod H and lever M. The latter is connected to a piston, K, work-

piston K is forced up, and the valve B is opened wide. Reduction of pressure in the air receiver allows the weight N to descend and the relief-valve B to be again closed. The action, it will be understood, is entirely automatic, the pressure ranging between 3 or 4 pounds and the pump working at practically a constant speed.

The New York office of the Clayton Works is at 43 Dey street.

Pneumatic Signal Gong.

James M. Everhart (Scranton Brass and File Works), of Scranton, Pa., is putting on the market a pneumatic signal gong which in many respects is interesting and worthy of note. We annex an illustration which shows the device embodied in a signaling system in a mine shaft. The apparatus, it will readily be understood, will signal to and from as many stations as there are air chambers and gongs by simply pushing the plunger at any station into the air chamber as many times as it is desired to give taps. The signal from station No. 3, for example, would be three, from No. 4 four, and from No. 5 five, taps, and so on, all stations receiving the signals at the same time and avoiding all possibility of misunderstanding. The same tubes that are used for signaling in this way can be

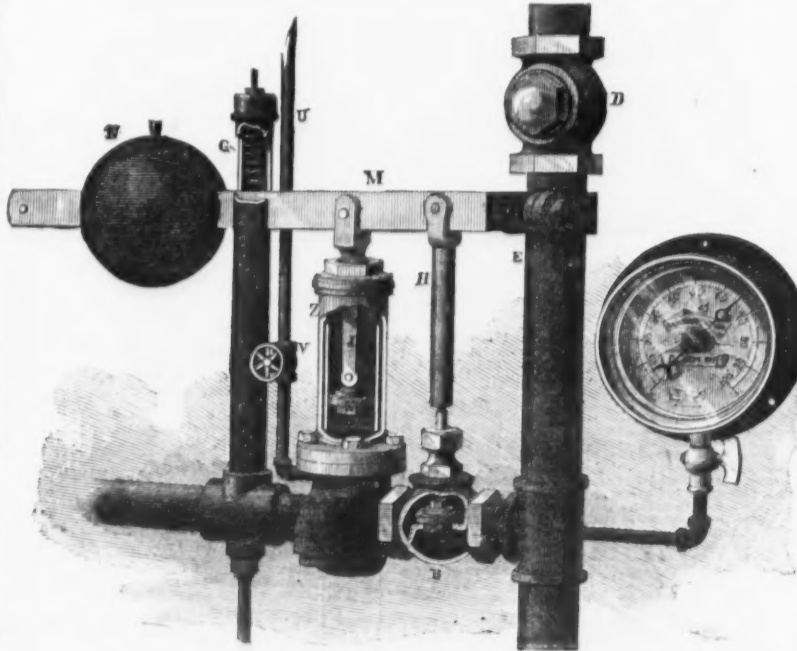


Pneumatic Signal Gong, Made by J. M. Everhart, Scranton, Pa.

used as speaking tubes without difficulty, and for that purpose mouthpieces are attached where desired. The advantages of the system are obvious and readily commend themselves.

The Etève Petroleum Engine.

A new petroleum engine known as the improved Etève engine is being introduced in England by the Holderness Foundry, of Hull. The engine is described as very simple in construction and action, and likely to command an extensive sale. The petroleum for a two days' supply or more is stored in a small tank inside the engine bed-plate. Into this tank air is pumped at a pressure of about 2 pounds per square inch above that of the atmosphere, the petroleum being forced out into a heated receiving-pipe, through which it is drawn along with the air by the piston into the cylinder. This receiving-pipe being jacketed, the exhaust passing from the cylinder gives out the necessary heat for the new charge. On the inward stroke of the piston the charge is compressed and then exploded by an electric spark, one explosion taking place every two revolutions of the engine. For heating the



PNEUMATIC PRESSURE RELIEF GOVERNOR.

Made by the Clayton Steam Pump and Air Compressor Works, Brooklyn, N. Y.

ing in an air cylinder, Z. A pipe, U, attached to the lower end of this cylinder and furnished with the valve V establishes communication with the air receiver. The air pressure tends to raise the lever M and weight N through the agency of the piston K. The weight N is so placed that it will balance the maximum pressure of air needed for the work to be done. A check-valve, D, is placed in the discharge-pipe E, so that the compressed air shall not return and escape through the relief-valve B when it is open. When the compressor is at work it forces the compressed air through the check-valve D and discharge pipe E into the receiver until the air is compressed to, say, 100 pounds pressure per square inch. This pressure acts through pipe U and valve V under the piston K, the pressure being balanced by weight N. When, however, the pressure rises 3 or 4 pounds above the working pressure it lifts the relief-valve, and the air is exhausted into the cylinder Z. The

inlet-pipe to the cylinder when first the engine is started a lamp is arranged which burns for a few minutes, when a turn or two of the fly-wheel is taken and starts the engine, the lamp being then extinguished. No oil for lubricating the cylinder is required, the charge itself containing sufficient lubricant. The electric spark is supplied by one bichromate cell, which dispenses with a naked light, and is free from those dangers of fire which attend naked lights. Great regularity in speed is maintained through the governor.

In 1831 John Stephenson, the veteran builder of horse cars, designed and built the first tram car of the first railway for street service in this country or abroad. The car consisted of three separate compartments, each compartment holding 10 persons, being entered by separate doors on the side. Seats were provided on top of the car for 30 more persons.

Foreign Markets.

FRANCE.

PARIS, October 28, 1886.—*Metals*.—A moderate amount of business has been done at a decline in Copper and Tin, and steadiness in Lead and Spelter. We quote at the close in francs per 100 kg.: Copper, Chili Bars, 107.50 @ 110; Ingots and Slabs, 112.50; Best Selected, 116.50; and Pure Corro Ore, 110. Tin—Banco, 372; Billiton, 371; Straits, 365.50; Australian, 370; and English, 366.25; Lead, 32.25 @ 33.25; and Spelter, 37.75 @ 38. Iron.—We are assured all the time from the French iron regions that we are on the eve of a revival; yet it does not come. Meanwhile the syndicates are making every effort to prevent the momentary stagnation in the iron trade from bringing about a fresh breakdown. In this city the weakness is gaining ground daily, and the Northern rolling-mill owners have again resolved to reduce their output still further, in order to counteract the drooping tendency at Paris. Merchant has meanwhile declined in this city to 13.50 and Beams to 13.25. At the Valenciennes meeting of ironmasters it was resolved to curtail production at once 10%. In the Ardennes the moderate orders received are mostly for immediate deliveries; the tendency there is downward. In the Haute-Marne a meeting came-off at Saint-Dizier; makers declared themselves contented with the business doing and raised the price 1 franc per 100 kg. all round. This establishes the price of Coke Merchant at 13 francs for No. 1; Mixed, 14 @ 14.50; Prime Special, 13.50 @ 14. In the Loire district and Central France there is no improvement; no stone is left unturned by makers to create, if possible, a better state of affairs, but the proximity of winter forbids entertaining expectations of success. Coal is firm despite the fine weather we are having here.—*Moniteur des Intérêts Matériels*.

BELGIUM.

BRUSSELS, October 28, 1886.—*Iron*.—There has been some disappointment at the non-arrival of orders from the extreme East, but there is in other respects no essential change to be reported with reference to the general Belgian iron market. The syndicate figures are scrupulously and firmly upheld. There has on the other hand been more difficulty in agreeing to curtail production on the basis that had been laid down than had been supposed; hence the whole matter will remain in abeyance till January next. Prices have meanwhile been steady, as follows: Merchant Iron 10 @ 10.55 francs per 100 kg.; Beams, 10; Angles, 11.50 @ 12.25; Sheets, No. 12 @ 12.50; No. 3, 14.50; Commercial, 16.50; Thin Sheets, 18.50; and No. 4, 20.50. Pig Iron exhibits considerable firmness; Charleroi Foundry, 5.50; ditto Forge, 3.80 @ 4.90; Luxembourg, No. 5, 3.80. Foreign quotations are for large lines; lots of less than 100 tons cost 10 centimes per 100 kg. more. The dissensions which had arisen between M. Sadoine, chairman of the Board of Managers of the Cockerill Company, and his colleagues, caused that gentleman and M. Victor Heffroid to resign. M. Sadoine is opposed to the company's embarking on such a vast scale in branch iron works as is proposed in Russia. As M. Sadoine is the leading spirit in the company, shareholders are trying to prevail on him to stay, proposing that a new Board of Managers be elected. Meanwhile the shares of the company had materially declined in value, pending a solution of the difficulty. Coal—Continues looking up, and Coal for domestic use is now firm at 12 francs per ton.—*Moniteur Industriel*.

GERMANY.

HAMBURG, October 28, 1886.—*Iron*.—With the exception of Steel Rails which may remain depressed for some time to come, the Iron and Steel situation has been steadily improving. The demand for Pig Iron has become more active, leading to a slight advance in Forge Pig, while Foundry remains unchanged. Foundries still complain of a lack of work. In the rolling-mill branch on the contrary, there has been great animation during several days in Rhenish Westphalia; no actual advance has, however, been established so far. The tendency in Sheets has become quite a favorable one. Wire Rods have been more wanted and higher, whereas Iron Wire remains neglected. Stocks of the latter increase and cause some uneasiness, with the dull winter season before us. No essential change has occurred in Railroad Material. The car works have received orders for 485 passenger and freight cars. Machine shops are not very busy and prices are depressed. Metal founders state that October has been a dull month for them. In Steel Rails German makers have been beaten by the Darlington Iron and Steel Works at the Eastern Railroad adjudication, in Prussia, for 8,338 tons. As in reality the output of Pig Iron in Upper Silesia has not been curtailed to speak of, nor will be, it is doubtful whether by April 1 next the stock of Pig Iron will be exhausted. *Metals*.—Lead is scarce in this market and held higher; Copper is weaker; Tin is firm. We quote toward the close: German Lead, 13.50 @ 14 marks per 50 kg.; Copper, Lake, 55; Spelter, 14.50 @ 15, and Tin, 104 @ 108; Sheet Zinc, 20 @ 20.50; White, 31 @ 33; do. Gray, 30 @ 32; and Quicksilver, 4.15 @ 4.30 per 10 kg.—*Borsenhalles*.

HOLLAND.

ROTTERDAM, October 28, 1886.—*Tin*.—Has on the whole been rather easier. At 61.50 guilders there are buyers of Banca for November delivery, but it is held for a higher figure. Billiton, spot, is offering at 61; January has been done at 61.75. The Government returns for the month of July are as follows:

Export of Tin from Holland.

	1886.	1885.	1884.
To Germany.....Tons	428	346	379
England.....	30	198	2
Belgium.....	91	55	50
France.....	23	41	64
Hamburg.....	26	60	32
The United States.....	16	406	25
Other countries.....	18	62	13
Total.....	692	1,198	578
Seven months.			
	1886.	1885.	1884.
To Germany.....Tons	3,181	2,718	3,000
England.....	114	457	378
Belgium.....	555	410	383
France.....	150	328	175
Hamburg.....	319	282	273
The United States.....	295	608	330
Other countries.....	328	358	266
Total.....	5,011	5,061	4,835

—Koch & Vlierboom.

SPAIN.

BILBAO, October 16, 1886.—*Iron Ore*.—Shipments during the week have been light but prices well sustained at 6/6 @ 6/3 Kubos and 6/4 Campanil; the little that was shipped has been in prime condition. The stormy weather has prevented vessels from leaving port. Steamers are scarce, being diverted toward the Baltic prior to the close of navigation there. Meanwhile freights remain unaltered. Shipments so far 2,538,107 tons, against 2,758,904 in 1885.—*Bilbao Maritime y Comercial*.

AUSTRIA.

VIENNA, October 24, 1886.—*Iron*.—Bonemian Merchant Iron is held higher; it rules at present at a figure equal to that of April last. The feeling in general is better in Austria-Hungary. We quote at the close in this city: Pig, 60 @ 49 florins per ton; Merchant, 94 @ 125.50; Sheets, 140 @ 175, and Beams, 105 @ 110. Metals have fluctuated a good deal, and a fair business has been done. We quote toward the close: Copper, 55 @ 50 florins per 50 kg.; Lead, 17.50; Spelter, 18.50; Tin, 125 @ 135; Antimony, 35, and Quicksilver, 230.—*Austrian Trade Journal*.

EAST INDIES.

PENANG, September 19, 1886.—*Tin*.—Our last report was dated 3d inst., when the price improved from \$37.50 to \$37.75, in order to recede to \$36.12½, but finally recovered to \$37, at which figure it, however, closed weak. Receipts meanwhile reached 10,000 piculs, of which Europeans took 600 and Chinese 9,400.—*Schmidt, Kusfermann & Co.*

SINGAPORE, September 22, 1886.—*Tin*.—Here and in Penang sales have been made to the extent of 600 tons, the market closing very firm at \$37.50, buyers. A week ago the value was \$36. Supplies are plentiful, but a good deal is going to China, which will cause smaller shipments to the United States and England than was expected. Tonnage—London rates by steamer are maintained at 2½ for weight. For New York the St. Andrea and Vergine della Guardia occupy the berth at unchanged rates. For Boston the Erie Bay continues her loading. *Exchange*—has advanced to 3¼ for six months' credits. The Order left for New York with 840 piculs Tin.—*Güllfian, Wood & Co.*

Ties, Rails. Steel Ties—Standard listdis 50x10
Timbers. **Timners' Shears, &c.** Shears and Snips (P. S. & W.)dis 20 45 25 5
Snips, J. Mallinson & Co.dis 33 4 5
Tinware. Stamped, Japanned and Pileed, Cen- tral Stamping Co., list June 1, 1880.
Pileed, S. S. & Co.dis 35 4 5
Japanned, S. S. & Co.dis 33 4 5
Stamped, S. S. & Co.dis 33 4 5
Tobacco Cutters. Enterprise Mfg. Co. (Champion)dis 20x10 @ 30 4
Wood BottomP doz \$5.00 @ \$5.25
All IronP doz \$2.50dis 10 4
Nashua Lock Co.P doz \$2.00, dis 30 45 25 5
Wilson'sdis \$2.4
Clippers (Sargent & Co.)P doz \$2.4, dis 30x10x10 4
AcmeP doz \$2.00, dis 30 4
Tranrom Lifters. Wolfenbark's Patent Iron Broweddis 50 4
Rehner's Improved Self-Locking (Class 201)dis 55 4
Rehner's (Class 101)dis 55 4
Excelsiordis 50x10x2 4
Shaw'sdis 45x10 4
Payson's Universaldis 40 4
Crown and Stardis 50 4
Traps. **Game.** Newhousedis 35 45 40 4
Onelda Patterndis 40x10x10 4 70 4
Game, Black's Patentdis 40x10x5 4
Mouse and Rat. Mouse, Wood, ChokerP doz holes, 15 4
Mouse, Round WireP doz \$1.50, dis 10 4
Mouse, Catch WireP doz \$2.50, dis 10 4
Mouse, Catch-on-aliveP doz \$2.50, dis 10 4
Mouse, "Bonanza"P gross \$10 amt 4
Mouse, DelusionP gross \$15.00, dis 15 4
Rat, "Becky"P gross \$10.00, dis 10 4
IdealP gross \$5.25
EcoloneP gross \$5.25
Trowels. Lothrop's Brick and Plasteringdis 30 45 20x5 4
Trucks' Brick and Plasteringdis 15 4
Dixon's Brick and Plasteringdis 20x10x10 20x10x5 4
Peace's Plasteringdis 25 4
Clement & Maynard'sdis 20 4
Roe's Brickdis 10 4
Brade's Brickdis 25 4
Worral's Brick and Plasteringdis 30 4
Gardendis 70 4
Triers. Butter and Cheesedis 35 4
Trucks & Warehouse, &c. Fenfield Block Co.'s list, 1882,dis 40
Tubes, Boiler.—See Pipe.
Twine. No. 9, Flax Twine, 4 and 5 B Balls22 4 30 4
No. 15, " " 4 and 5 " " 20 4 25 4
No. 14 and 5 " " 20 4 25 4
No. 24, " " 4 and 5 " " 18 4 27 4
No. 35, " " 4 and 5 " " 17 4 26 4
No. 36 and 5 " " " " 17 4 26 4
Chalk Line, Cotton, 1/2 B Balls20 4
Mason Line, Linen, " " " " 50 4
Fly Hemp, 4 and 5 B Balls (strong Twine)12 4
Fly Hemp, 1 B Balls11 4
Fly Hemp, 1 1/2 B Balls14 4 15 4
2, 3, 4 and 5 Fly Jute, 4 B Balls5 4 6 4
Wool5 4 6 4
Paper15 4 17 4
Cotton Rope—4, 9, 12 and 15 to 40 fms.14 4
Vices. Solid Boxdis 60 4 60x5 4
Washers. Fisher & Norris Double Screwdis 15x10 4
Stephens'dis 25 4
Parson'sdis 15 4
Wilson'sdis 55 4
Howard'sdis 40 4
Bouney'sdis 40 4
Miller Fallsdis 40 4 40x10 4
Trentondis 40x5 4 40x10 4
Merrill'sdis 40x20 4
Sargent'sdis 40x10x10 4
Backus and Uniondis 40 4
Union Screw Loedis 15x10 4
Prentissdis 40 4
Simpson's Adjustabledis 40 4
Saw Vices. Bouney's Nos. 2 & 3P doz \$15.00, dis 40 4
Stearns'dis 40 4
Sargent'sdis 40x10x10 4
Hopkins'dis 40 4
Readingdis 37 4 40 4
Wentworthdis 20x10 4
Combination Hand Visedis 40 4
Cowell Hand Visedis 25 4
Baker's Pipe Visedis 10 4
Amateur ViseP gro, \$15.00
Wagon Boxes. **Washer Cutters.** Withers' PatentP doz \$12.00, dis 20x10x10 4
Smith's PatentP doz \$11.00, dis 23 4 4
Perry'sP doz \$11.4, dis 40 4
Appleton'sP doz \$16.00, dis 60x10 4
Bonner'sdis 30x10 4
Washers.—See Nuts and Nuts.
Wedges.—IronP B 34 4
Steel. **Well Buckets.**—See Bails.
Hills'P doz, 12 ut., \$3.50; 14 ut., \$4.50
Iron CladP doz, 14 ut., \$4.25, dis 40 4 40x5 4
Perry's Flat Iron BandP doz \$4.25
Whiting's Wires TopP doz \$4.00
Well Holes—8 in., \$1.75; 10 in., \$2.50; 12 in., \$2.75
Wire. **Iron.** Market, Irt & Ann'd, Nos. 0 to 18dis 72 4 5 6 75 4
Market, Coppered, Nos. 0 to 18dis 70 4
Market, Galvanized, Nos. 0 to 18dis 70 4
Market, Tinned, Irt, Nos. 0 to 18, dis 69 4 10 4
Stone Bright and Annealed, Nos. 10 to 18, dis 69 4 5
Stone, Bright and Annealed, Nos. 19 to 24, dis 69 4 5
Stone, Bright and Ann'd, Nos. 27 to 30, dis 72 4 5
Stone, Galvanized, Nos. 19 to 24, dis 55 4 5
Stone, Tinned, Tinned list, Nos. 19 to 24, dis 69 4 5
Tinned Brown Wire, Nos. 10 to 30dis 69 4 5
Annealed Fences, Nos. 8 & 9dis 65 4 5
Steel-wreathed Grape, Nos. 19 to 24dis 65 4 5
Brass and Copper, list Jan. 18, 84dis 33 4 35 4 35 4
Hart FenceSee Trade Report
Wire on Spoolsdis 62 4
Main's Spid. Wire, 1 B, 1 1/2 B & 3 B 40 4 40x10x5 4
Cast Steel Wiredis 50 4
Stub's Steel Wire, Nos. 12 to 30\$6.00 to \$2, dis 30 4
Steel Music Wire, Nos. 12 to 30dis 50 4
Picture Wiredis 60x10 4
Hart & Fire Safety GuardsP 1000 \$6.00, dis 25 4
Wire Clothes Lines. See Lines.
Wire Cloth. Green, drab and black, best quality, P 100 sq. ft., \$2
Wire Goods.—See Bright Wire Goods.
Wire Rope.—List May 1, 1880dis 33 4 5
Wrenches.—American Adjustabledis 40 4
Baxter's Adjustable "S"dis 40 4
Baxter's Diagonaldis 40 4 40x10 4
Coe's Genuinedis 60x2 4
Coe's "Mechanics"dis 40 4
Coe's Pattern, Malleabledis 60x10 4 60x1 4 5 4
Coe's Pattern, Wroughtdis 60x10 4
Girard standarddis 70x10 4
Girard Agriculturaldis 80x10 4 80x10x5 4
Lamson & Sessions' Engine "rs"dis 60x10 4
Lamson & Sessions' Standarddis 60x2 4
Lamson & Sessions' Agriculturaldis 80 4 80x10 4
Sterling Wrench, Wroughtdis 80x10 4
Harris & Call's Patent Combinationdis 60x2 4
Harris & Call's Merrick's Patterndis 35 4
Harris & Call's Briggs' Patterndis 25 4
Harris & Call's Cylinder or Gas Pipedis 40x2 4
Harris & Call's No. 3 Pipedis 35 4 4
Aiken's Pocket Bright\$1.00, dis 60x10 4
The Favorite Pocket BrightP doz \$4.00, dis 40 4
Webster's Patent Combinationdis 25 4 25 4
Hoardman'sdis 25 4 25 4
Always Readydis 25 4
Alligatordis 50 4
Donohue's Engineerdis 25 4
Acme, Brightdis 60x2 4 60x10 4
Acme, Nickle'ddis 45 4
Acme, Bicycle, 1/2 in.dis 45 4
Walkerdis 60x2 4
Rounddis 40 4
Diamond Patent Steeldis 40 4 4
Wrought Goods. Staples Hooks, &c.dis 80x10 4 80x2 4
ing Materials.
Incorporated 1881. THE
Largest Manufacturers
IN THE WORLD OF
Nickel Anodes,
Nickel Salts,
Patent Muslin Buffs,
Polishing Lathes,
Polishing Felt,
Polishing Rouges,
Pol'ng Compositions,
Walrus Leather,
Wood Emery Wheels
Platers' Brushes,
&c., &c., &c.
OFFICES :
36 to 40 11th Ave., NEW YORK, U. S. A.

WHOLESALE METAL PRICES, November 10, 1886.

METALS.

IRON.—Duty: Bars, 8-10¢ to 11-10¢ per lb.; provided that no Bar Iron shall pay a less rate of duty than 35¢. Sheet, 11-0¢ to 15-10¢ per lb. Band, Hoop and Scroll, 14¢ to 14-10¢ per lb. Railroad Bars weighing more than 25 lb. per yard, 7-10¢ to 14¢ per lb.

Standard American Pig Iron.
 Foundry No. 1, 1886, 1900 18.50 to 19.00
 Foundry No. 2, 1886, 1900 17.50 to 18.00
 Gray Forge, 1886, 1900 16.00 to 16.50

No. 1 Scotch Pig Iron.
 Cambros, 1886, 1900 19.25 to 20.00
 Coltness, 1886, 1900 20.00 to 20.25
 Shotts, 1886, 1900 20.00 to 20.25
 Glasgow, 1886, 1900 19.00 to 19.25
 Gartcharrie, 1886, 1900 19.00 to 19.25
 Lanark, 1886, 1900 19.00 to 19.25
 Summerlee, 1886, 1900 18.75 to 19.00
 Dalmeny, 1886, 1900 18.75 to 19.00
 Eglinton, 1886, 1900 18.50 to 18.75
 Clyde, 1886, 1900 18.50 to 18.75

Steel, at Eastern mills.—1886, 1900 34.50 to 35.00
 Old Italia, 1886, 1900 21.75 to 22.00

Scrap.
 Wrought, 1886, 1900 19.50 to 20.00

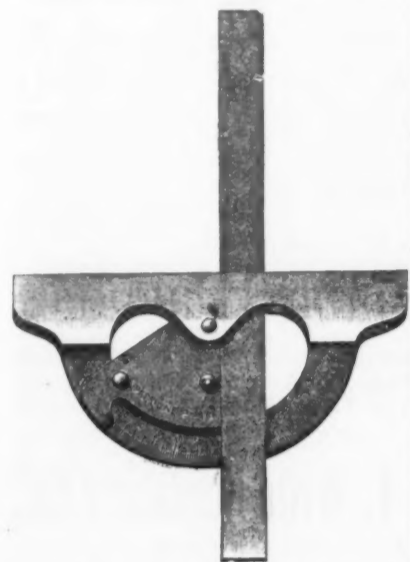
Bar Iron from Store.
 Common Iron: 1/2 to 2 in. round and square, 1886, 1900 1.80 to 1.90¢
 1 to 6 in. x 1/2 to 1 in. 1886, 1900 2.30 to 2.40¢

Refined Iron: 1/2 to 2 in. round and square, 1886, 1900 2.30 to 2.40¢
 1 to 6 in. x 1/2 to 1 in. 1886, 1900 2.30 to 2.40¢
 Rods—1/2 to 1 in. round and square, 1886, 1900 2.30 to 2.40¢
 Bands—1 to 12 in. x 1/2 to 1 in. 1886, 1900 2.30 to 2.40¢
 Burden's Best "Iron, base price 1886, 1900 2.50 to 2.60¢
 Burden's "H. B. & S." Iron, base price 1886, 1900 2.50 to 2.60¢
 Norway Rods 1886, 1900 2.50 to 2.60¢

Sheet Iron from Store.—R. G. American, Cleaned.
 Nos. 10 to 16, 1886, 1900 2.70 to 2.80¢
 17 to 20, 1886, 1900 2.80 to 2.90¢
 21 to 24, 1886, 1900 2.90 to 3.00¢
 25 and 30, 1886, 1900 3.00 to 3.10¢
 31 and 36, 1886, 1900 3.10 to 3.20¢
 37 and 42, 1886, 1900 3.20 to 3.30¢
 43 and 48, 1886, 1900 3.30 to 3.40¢
 49 and 54, 1886, 1900 3.40 to 3.50¢
 55 and 60, 1886, 1900 3.50 to 3.60¢
 61 and 66, 1886, 1900 3.60 to 3.70¢
 67 and 72, 1886, 1900 3.70 to 3.80¢
 73 and 78, 1886, 1900 3.80 to 3.90¢
 79 and 84, 1886, 1900 3.90 to 4.00¢
 85 and 90, 1886, 1900 4.00 to 4.10¢
 91 and 96, 1886, 1900 4.10 to 4.20¢
 97 and 102, 1886, 1900 4.20 to 4.30¢
 103 and 108, 1886, 1900 4.30 to 4.40¢
 109 and 114, 1886, 1900 4.40 to 4.50¢
 115 and 120, 1886, 1900 4.50 to 4.60¢
 121 and 126, 1886, 1900 4.60 to 4.70¢
 127 and 132, 1886, 1900 4.70 to 4.80¢
 133 and 138, 1886, 1900 4.80 to 4.90¢
 139 and 144, 1886, 1900 4.90 to 5.00¢
 145 and 150, 1886, 1900 5.00 to 5.10¢
 151 and 156, 1886, 1900 5.10 to 5.20¢
 157 and 162, 1886, 1900 5.20 to 5.30¢
 163 and 168, 1886, 1900 5.30 to 5.40¢
 169 and 174, 1886, 1900 5.40 to 5.50¢
 175 and 180, 1886, 1900 5.50 to 5.60¢
 181 and 186, 1886, 1900 5.60 to 5.70¢
 187 and 192, 1886, 1900 5.70 to 5.80¢
 193 and 198, 1886, 1900 5.80 to 5.90¢
 199 and 204, 1886, 1900 5.90 to 6.00¢
 205 and 210, 1886, 1900 6.00 to 6.10¢
 211 and 216, 1886, 1900 6.10 to 6.20¢
 217 and 222, 1886, 1900 6.20 to 6.30¢
 223 and 228, 1886, 1900 6.30 to 6.40¢
 229 and 234, 1886, 1900 6.40 to 6.50¢
 235 and 240, 1886, 1900 6.50 to 6.60¢
 241 and 246, 1886, 1900 6.60 to 6.70¢
 247 and 252, 1886, 1900 6.70 to 6.80¢
 253 and 258, 1886, 1900 6.80 to 6.90¢
 259 and 264, 1886, 1900 6.90 to 7.00¢
 265 and 270, 1886, 1900 7.00 to 7.10¢
 271 and 276, 1886, 1900 7.10 to 7.20¢
 277 and 282, 1886, 1900 7.20 to 7.30¢
 283 and 288, 1886, 1900 7.30 to 7.40¢
 289 and 294, 1886, 1900 7.40 to 7.50¢
 295 and 300, 1886, 1900 7.50 to 7.60¢
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 307 and 312, 1886, 1900 7.70 to 7.80¢
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 319 and 324, 1886, 1900 7.90 to 8.00¢
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 337 and 342, 1886, 1900 8.20 to 8.30¢
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 355 and 360, 1886, 1900 8.50 to 8.60¢
 361 and 366, 1886, 1900 8.60 to 8.70¢
 367 and 372, 1886, 1900 8.70 to 8.80¢
 373 and 378, 1886, 1900 8.80 to 8.90¢
 379 and 384, 1886, 1900 8.90 to 9.00¢
 385 and 390, 1886, 1900 9.00 to 9.10¢
 391 and 396, 1886, 1900 9.10 to 9.20¢
 397 and 402, 1886, 1900 9.20 to 9.30¢
 403 and 408, 1886, 1900 9.30 to 9.40¢
 409 and 414, 1886, 1900 9.40 to 9.50¢
 415 and 420, 1886, 1900 9.50 to 9.60¢
 421 and 426, 1886, 1900 9.60 to 9.70¢
 427 and 432, 1886, 1900 9.70 to 9.80¢
 429 and 434, 1886, 1900 9.80 to 9.90¢
 435 and 440, 1886, 1900 9.90 to 10.00¢
 441 and 446, 1886, 1900 10.00 to 10.10¢
 447 and 452, 1886, 1900 10.10 to 10.20¢
 449 and 454, 1886, 1900 10.20 to 10.30¢
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 481 and 486, 1886, 1900 10.80 to 10.90¢
 483 and 488, 1886, 1900 10.90 to 11.00¢
 485 and 490, 1886, 1900 11.00 to 11.10¢
 487 and 492, 1886, 1900 11.10 to 11.20¢
 489 and 494, 1886, 1900 11.20 to 11.30¢
 491 and 496, 1886, 1900 11.30 to 11.40¢
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 495 and 500, 1886, 1900 11.50 to 11.60¢
 501 and 506, 1886, 1900 11.60 to 11.70¢
 507 and 512, 1886, 1900 11.70 to 11.80¢
 509 and 514, 1886, 1900 11.80 to 11.90¢
 511 and 516, 1886, 1900 11.90 to 12.00¢
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 525 and 530, 1886, 1900 12.60 to 12.70¢
 527 and 532, 1886, 1900 12.70 to 12.80¢
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 537 and 542, 1886, 1900 13.20 to 13.30¢
 539 and 544, 1886, 1900 13.30 to 13.40¢
 541 and 546, 1886, 1900 13.40 to 13.50¢
 543 and 548, 1886, 1900 13.50 to 13.60¢
 545 and 550, 1886, 1900 13.60 to 13.70¢
 547 and 552, 1886, 1900 13.70 to 13.80¢
 549 and 554, 1886, 1900 13.80 to 13.90¢
 551 and 556, 1886, 1900 13.90 to 14.00¢
 553 and 558, 1886, 1900 14.00 to 14.10¢
 555 and 560, 1886, 1900 14.10 to 14.20¢
 557 and 562, 1886, 1900 14.20 to 14.30¢
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 561 and 566, 1886, 1900 14.40 to 14.50¢
 563 and 568, 1886, 1900 14.50 to 14.60¢
 565 and 570, 1886, 1900 14.60 to 14.70¢
 567 and 572, 1886, 1900 14.70 to 14.80¢
 569 and 574, 1886, 1900 14.80 to 14.90¢
 571 and 576, 1886, 1900 14.90 to 15.00¢
 573 and 578, 1886, 1900 15.00 to 15.10¢
 575 and 580, 1886, 1900 15.10 to 15.20¢
 577 and 582, 1886, 1900 15.20 to 15.30¢
 579 and 584, 1886, 1900 15.30 to 15.40¢
 581 and 586, 1886, 1900 15.40 to 15.50¢
 583 and 588, 1886, 1900 15.50 to 15.60¢
 585 and 590, 1886, 1900 15.60 to 15.70¢
 587 and 592, 1886, 1900 15.70 to 15.80¢
 589 and 594, 1886, 1900 15.80 to 15.90¢
 591 and 596, 1886, 1900 15.90 to 16.00¢
 593 and 598, 1886, 1900 16.00 to 16.10¢
 595 and 600, 1886, 1900 16.10 to 16.20¢
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 867 and 872, 1886, 1900 29.70 to 29.80¢
 869 and 874, 1886, 1900 29.80 to 29.90¢
 871 and 876, 1886, 1900 29.90 to 30.00¢
 873 and 878, 1886, 1900 30.00 to 30.10¢
 875 and 880, 1886, 1900 30.10 to 30.20¢

Victor Bevel Protractor.

This article is put on the market by the Victor Mfg. Company, Athol, Mass., and is designed to meet the demand of tool-makers and machinists for a light, convenient and accurate instrument for obtaining and transferring angles. It is illustrated in the accompanying cut. The blade swings between the two working faces of the head or stock, and when clamped at any degree the angle may be set off to the right or left without any further adjustment, by simply turning the tool over. By means of the index point and divided quadrant the blade may be set at any angle from 0° to 90°, and firmly clamped. The blade slides its full length on the working face of the sector, thus giving a long bearing surface, and not liable to wear. The blade may also be drawn back, leaving the face of the head clear for use on surface plates, and on platens of planers for setting the head at any angle, which is referred to as a valuable feature. An extra blade, 3 inches long and brought to a point by beveling off one side at an angle of 30°, is included with the tool, and is alluded to as convenient for inside dovetailing. Attention

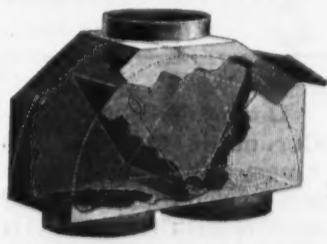


The Victor Bevel Protractor.

is called to the fact that, instead of setting the index point at the center of the division mark, this tool is adjusted so as to show the full size of the mark forward of the index. The quadrant, it will be observed, is divided to degrees. This tool is made entirely of steel, bright polished all over, weighs 4 ounces, and is referred to by the company as durable in every part, and sold as low as the quality of the tool will admit. It is made in two sizes, 6 and 9 inch, which are furnished either polished or nickel-plated, as desired.

The Get-at-Able Cut-Off.

The accompanying illustration represents a cistern cut off that is being manufactured by the Henderson & Harker Mfg. Company, of Columbus, Ohio. On account of its features it has been called the Get-at-Able Cut-Off. This name is due to the means which have been provided for getting at the interior of the cut-off for the purpose of removing obstacles, or for thawing out in winter. The top of the pipe leading to the cistern is provided with a screen for the purpose of preventing sticks, leaves, hags, &c., from entering the cistern. Of course with this there would be a certain accumulation of dirt inside of the cut off. To remove this the device is provided with openings with slide doors by which access to the interior is had. In the winter time, in the event of the cut-off being rendered inefficient by freezing, the door can be opened and hot water poured through from a tea-kettle for the purpose of thawing out the pipe. The



The Get-at-Able Cistern Cut-Off.

wire gratings used over the outlets for preventing substances from entering the cistern can be as fine or as coarse as best suits the owner of the house upon which the cut-off is employed. The special feature in the construction of this device is that the valve is so adjusted that it is entirely free and independent of the casing. It is moved from one position to the other easily and without strain or friction. The force of the water holds the valve in position, and all the water passes through the outlet for which it is set. We understand that these goods are made of the best grades of charcoal tin plates with special machinery, and that they are finished in a first-class manner in all respects.

Solid-Steel Silver-Plated Table Cutlery

The Silver Plate Cutlery Company, Birmingham, Conn., are putting on the market a line of solid-steel table cutlery, in which the style of ornamentation represented in the accompanying illustration is used. The illustration represents the handle and portion of the blade of the carving knife belonging to a set, which they designate as the Rogers Pattern No. 1. It is described as forged by Sheffield workmen from one solid piece of the best English carvers' steel, and as having a spring-tempered blade with thin razor edge, especial attention being, however, directed to the arabesque finish which is given to the handle. In addition to the effectiveness and beauty of this style of

finish the point is made that solid handled carvers have not heretofore been a success, as the handles to be large enough to grasp and hold easily when given a smooth finish were too heavy, this objection being removed by the style of low-relief finish given to this line of goods, with which, it is claimed, the handles can be made of a shape satisfactorily conforming to the hand, and



Finish of the Silver-Plate Cutlery Co.'s Handles.

sufficiently light. The handles of the carver, fork and steel and the fork throughout have a heavy triple plate of silver, and are hand-burnished. The circular of the company, besides the No. 1 shown herewith, illustrates other designs in which similar decoration is used—the Derby Pattern, No. 2, with square end, scimitar blade; the Moresque, No. 3, Windsor handle; the Leaf, No. 4, with square end; the Eastlake, No. 6, which is a solid-steel tempered fork, with diamond shank, patented, and the Diamond, No. 7, which is a fruit knife made in square end and Windsor styles. Their No. 5 is Alligator style. These goods are given the plain or the old-silver finish. To go with the carver represented in the illustration the company are making a fork protected with a guard, to which they call special attention, which when up or down will prevent the tines from touching the table linen, and so arranged that when at rest, in connection with the edge between the tines, it serves as a strong and efficient skewer puller. The tines of the fork are made more curved than usual, which is referred to as an advantage enabling the carver to do his work with more facility. In putting these goods on the market the company emphasize not only the attractiveness of the decoration, but also the quality of the cutlery.

MANUFACTURING.

Iron and Steel.

Charles Ridgely, president of the Springfield Iron Company, of Springfield, Mass., was in Pittsburgh last week and signed a contract with Boyle & Bissell, of that city, the representatives of Gordon, Strobel & Laureau, Limited, of Philadelphia, for the erection of a steel plant consisting of two 4-ton Bessemer steel converters, ladles, cranes and all other details. The works will have a capacity of 200 tons per day.

Four new boilers of 60 horse-power each have just been put into the works of the Hartman Steel Company, Limited, at Beaver Falls, Pa., and a large addition to their steel wire picket fence factory is under way.

The output of the Lucy Furnaces, at Pittsburgh, for the month of October was remarkably large. No. 1 produced 7103 tons and No. 2 produced 7175 tons, or a total of 14,281 tons for both furnaces.

Twenty-six thousand two hundred and eighty tons of Bessemer and open hearth steel were made during the month ending October 30 at the works of the Pennsylvania Steel Company, Steelton, Pa.

Joseph D. Potts, proprietor of the Isabella Furnace, at Barnston, Pa., informs us that the report published to the effect that he was about to erect a steel plant at that place is without foundation. He has no intentions whatever of erecting a plant.

The Vulcan Iron Works have commenced work on their order for 1500 tons of castings for the North Side Cable Road. They have also been awarded the contract for the swinging machinery for the new Twelfth-street bridge, and received an order for their large improved car pile driver from the A. T. and S. F. R. R.—Chicago Industrial World.

The foundry of Maxwell, Silliman & Evans, Limited, situated at the corner of South avenue and Walker street, Allegheny City, Pa., is offered for sale.

The charter of the Catasauqua Mfg. Company, of Catasauqua, Pa., having expired, the State authorities have rechartered the company with a capital of \$339,850.

The Christiansa Rolling Mills, in South Wilmington, Del., have been leased by Pennsylvania capitalists.

Keystone Furnace, at Chain Dam, Pa., belonging to the Thomas Iron Company, of Catasauqua, will be blown in as soon as repairs are completed.

The old Grashopper Mill plant, at Youngstown, Ohio, was sold on the 6th inst. at sheriff's sale to H. O. Bonnell, president of the Mahoning Valley Iron Company, of that place, for \$10,000. The purchase covers only the real estate, amounting to a little over 5 acres. The Mahoning Valley Iron Company will at once commence the erection upon it of a mammoth warehouse for storing and shipping iron, the land adjoining the extensive mills owned by the company. Its location will give the concern excellent shipping facilities.

Gabel, Jones & Gabel, of Boyertown, Pa., inform us that the report that they were about to erect a large nail mill at the above place is without foundation.

The Ohio Falls Iron Works, of New Albany, Ind., inform us that they have completed repairs and are now running double

turn in all departments. These works make iron up to 12 inches wide, and make iron especially adapted to railroad use, car manufacturers, plow and wagon works.

The plant of Arms, Bell & Co., at Youngstown, Ohio, which passed into the hands of E. L. Wilder and Edwin Bell as receivers two years ago, has been so success-

fully conducted that 51 per cent. of the first mortgage indebtedness has already been paid, and if trade continues the entire debt will be wiped out within a year and the property returned to those who established the plant.

The nail factory of the Etna Iron Works, Limited, at Newcastle, Pa., was closed down on the 6th inst. for an indefinite period.

Mary Furnace, owned by the Ohio Iron and Steel Company, of Lowellville, Ohio, which was recently put in blast, is making 115 tons per day, and is expected to increase this product to 150 tons per day in a short time.

M. V. Smith, metallurgist, of Pittsburgh, has been appointed consulting engineer and purchasing agent for the new steel plant now being erected by the Chicago Steel Company, at Hammond, Ind. The plant will be completed about February 15 next, and will have a capacity of 150 tons per day, its product being steel nails, car axles and steel billets.

The Western Nail Works, Belleville, Ill., made 52 working days in the month of September and October, running their steel plant and rolling-mill departments double turn, and their nail factory department single turn of 10 hours per day, operating 154 nail machines, making and selling in September and October 57,056 kegs of assorted steel nails and 500 tons of steel slabs. The company are now putting in an Excelsior electric machine in their steel plant.

The stockholders of the Bridgewater Iron Company, of Bridgewater, Mass., have finally assigned the entire business and plant of the company to the trustees appointed by the creditors.

A car-wheel foundry is now nearly completed at East Buffalo, N. Y. The present capacity of the works, which are just ready to start, is 150 wheels per day. The works will be known as the Road & Brown Car Wheel Works.

The Windsor Locks Steel Company, of Bridgeport, Conn., are now running their works night and day. They have just added a 10-inch train of rolls, which will run on small guide rounds and will increase their production about 33 per cent.

Machinery.

A large force of men is employed at the old Swissvale Car Works, at Edgewood, near Pittsburgh, preparing the buildings for occupancy by the Union Switch and Signal Company, who recently purchased them. A wing is being put up in connection with the main building, which, with a new building, will double the capacity. It is not thought possible by the officials of the company to get into the new quarters much before the first of the new year. The company employ about 500 men, and provision for their residence has been made by the purchase of 33 acres of ground adjacent to the works, on which houses will be built. The extensions will double the capacity of the works, which are now running to the fullest extent, with more orders than can be filled. These include signals, interlocking switches and frogs, and are for railroads from Massachusetts to Missouri. During October the firm received orders for \$50,000 worth of work.

Davies & Thomas, machinists and founders of Catasauqua, Pa., are busy in all departments. The machine shop is getting out the double upright engines and shafting for the Unicorn Silk Mill, and the foundrymen are making car castings and conduits for underground telegraph lines in Philadelphia and New York. Prospects for a busy winter are bright.

At a meeting of the stockholders of the Westinghouse Electric Company, of Pittsburgh, held last week, it was voted to increase the capital stock of the company to \$5,000,000, and to purchase from Mr. George Westinghouse, Jr., the exclusive right to the Gaulard & Gibbs invention, the patent for which was recently issued, and which was announced generally throughout the press, leaving \$1,000,000 of stock in the treasury for sale at par. Preparations are being made at the works to manufacture apparatus necessary for 2000 to 3000 lights per day. Many letters are being received from gas companies as well as electric-light companies who are desirous of acquiring the right to use this new system of electric lighting.

The Wainwright Mfg. Company, of Boston, Mass., have sold their feed-water heaters to the following firms during the month of October: Westfield Plate Company, Thompsonville, Conn.; Badger Bros., Quincy, Mass.; Fairbanks & Co., Philadelphia, Pa.; Davidson Steam Pump Company, New York City; Gillis & Geoghegan, New York City; Richmond Water Works, Richmond, Mo.; Sayre Pipe Foundry Company, Sayre, Pa.; Chas. Theis, Nyack, N. Y.; Davidson Steam Pump Company, Boston; Westerly Water Works, Westerly, R. I.; Swartzchild & Selsburger, New York City. One of these furnaces has recently been shipped to Japan, one to Cuba and one to Canada. The company have recently

erected a purifying plant for preventing the formation of scale in the boilers of S. N. Brown & Co., Dayton, Ohio.

Lodge, Davis & Co., of Cincinnati, Ohio, are putting on the market a 25-inch back-gear power feed drill, and will soon get out a 30 inch in the same design; also new designs for Fox monitor lathes. They have

nearly completed their new three-story corrugated-iron building, 30 x 100 feet, for warehouse and offices, adjacent to their old works.

The Westinghouse Air Brake Company, of Pittsburgh, have declared a dividend of 50 per cent., and a stock dividend of four shares for one.

The Holly Mfg. Company, of Lockport, N. Y., builders of pumping machinery, propose to build a new large erecting shop, 100 x 165 feet.

At the annual meeting of the Fall River Machine Company, of Fall River, Mass., the following officers were elected: President, John S. Brayton; treasurer, George H. Bush; corporation clerk, Edward L. Griffin; directors, John S. Brayton, A. S. Tripp, A. S. Covel, Nathaniel Lindsey and Horace M. Barns.

The Siebert Patent Pulley and Journal Box Company, of St. Louis, have put in a boring mill for 144 inches diameter, and a grinding machine for 144 inches diameter and 72 inches face. These machines were designed and built by Mr. Siebert, of the company, and with them the facilities of the works are complete for the manufacture of pulleys ranging from 8 to 144 inches in diameter and from 3 to 72 inches face—round, whole or straight.—Age of Steel.

The postponed auction sale of the tools, fixtures and unfinished sewing machines of the Howe Machine Company, Bridgeport, Conn., was held Saturday, the 6th inst. The valuation of the property was about \$115,000. Edward Slaughter purchased the lot for \$5500.

The Prospect Machine and Engine Company, Cleveland, Ohio, report to us that they have among their late orders an engine of 265 horse-power for the Brown Hoisting and Conveying Company, and one of the same size for A. G. Cook, Laconia, N. H. They have just shipped one of their 450-horse-power engines to the Bohn Mfg. Company, St. Paul, Minn., and will soon ship an 850-horse-power engine to the A. H. Hart Company, New York, and one of the same size to the Mahoning Valley Iron Company, of Youngstown, Ohio. Their reel trade is also very encouraging. One of their late foreign orders is for 10 of their largest size Jonathan Mills dressers for a new mill in New Zealand.—Trade Review.

A. L. Ide & Son, Springfield, Ill., write us that they have designed an Ide engine as large as 250 horse-power, and that one of this size was built by the F. and M. Department of the Harrisburg Car Mfg. Company, of Harrisburg, Pa. (licensees for Eastern and Southern States), and is now running in Atkins's Saw Factory, at Indianapolis, Ind. Messrs. Ide & Son are now designing a size as small as 12 horse-power. The Reading (Pa.) Bolt and Nut Works have within the past week contracted for an 80-horse-power and the Lebanon (Pa.) Bolt and Nut Works for two 30-horse-power engines. A 150-horse-power Ide engine, provided with the new double-ported Ide valve, has just been put in J. N. Raymond's Lead Works and is now driving one of the largest and most improved sheet-lead rolls in the country. Last week's shipments by Ide & Son were: Two 60-horse-power (fourth order) to the Kansas City Electric Light Company, Kansas City, Mo., making five Ide engines they now have, running by the side of two Corliss engines. One 40-horse-power to Brown, King & Co., of Kansas City, and one 50-horse-power with boiler to Moore & Frunk, machinists, at Wellington, Kan. The Union Iron Works, at San Francisco, are now building the Ide engine for the Pacific Coast.

Wm. Barker & Co., of Cincinnati, Ohio, will soon put on the market a new cock grinding machine, for grinding keys in steam, water and gas cocks, with which a man, it is claimed, will be able to turn out as much work as half-a-dozen the old way. They are also engaged in turning out new 16 and 17 inch screw-cutting back geared engine lathes, for which, we understand, they have a large number of orders, and a lot of small valve milling machines.

The Bignall & Keeler Mfg. Company, of St. Louis, Mo., have just shipped one of their No. 4 pipe cutting and threading machines to New London, Conn., and a No. 8 machine to Syracuse, N. Y. They write us that prospects are good for an excellent winter's trade.

The New York Locomotive Works, of Rome, N. Y., have decided to compete for Western business, and their endeavors so far have been decidedly satisfactory. The company have just secured from the Union Pacific Railroad Company an order for 10 of their switch engines. The company are turning out now regularly three locomotives a week, and their shops have a capacity of turning out 15 locomotives every month.

Doyle & Co., Huntington, W. Va., will build a new machine shop.

L. W. & J. H. Mann will erect a 30 x 60 machine shop at Ocala, Fla., and will add a foundry.

The East Mississippi Machine and Foundry Works, capital stock \$60,000, have been in-

corporated at Meridian, Miss., by S. S. Williams, D. D. Briggs, J. S. Solomon, C. W. Robinson and others, to enlarge and operate the foundry and machine shop of Williams & Briggs.

The Erie Basin Dry Dock, in Brooklyn, is extending its machine shop 200 feet, to give increased room for the machinery to be used in the repair of vessels.

Hughes Bros., of Cleveland, have just completed a plant in Oil City, in which they place 20 of their pumps and hydraulic presses. They are running full time, and are hard pressed with orders.

Hardware.

Jos. Woodwell & Co., hardware merchants of Pittsburgh, have subscribed \$500 toward the erection of the new Exposition buildings in that city.

The committee appointed by the employees at the saw works of H. Diston & Sons, Philadelphia, to investigate the rates of wages paid in other steel works of the State, reported to the men at a meeting held recently that they found that the Distons were paying before the strike considerably higher wages than any steel manufactory in Pittsburgh. The committee also stated "there was no just cause for the recent strike of the employees." Of the 650 saw-makers who went on the strike all but 175 have thus far been re-engaged, and of the 85 steel-melting and rolling-mill hands all but 38 are working.

The Spafford Scale Company have been incorporated at Chicago; capital stock, \$10,000; incorporators, Wm. C. Spafford, Geo. H. Hess and Monroe L. Willard.

The National Tube Works, at McKeesport, Pa., are running double turn in every department. About 4000 men are employed, and heavy shipments are made daily. The capacity of the butt-welding department is being increased, and preparations are being made to erect a furnace that will weld a 24-inch pipe.

The extensive works of the Walker Horse-shoe Company, of Baltimore, were burned on the 3d inst., causing a loss of \$85,000, which is fully covered by insurance. The works have been idle for nearly a year, and a receiver has been appointed on the application of the stockholders.

The Bryden Horse Shoe Works, at Catasauqua, Pa., are running to 9 o'clock p. m. five days in the week, and should the demand increase two shifts will be put on, running both day and night.

The American Tube and Iron Company, of Middletown, Pa., have just sent us the following: "We take pleasure in announcing the completion of our Western mills at Youngstown, Ohio, which we have located to specially meet the requirements of the Western trade in connection with our Eastern mills at Middletown, Pa., which we shall continue to operate for the special benefit of Eastern business. With these prominent locations we now have unexcelled facilities for meeting all demands and making prompt deliveries of our line of goods to all sections of the country."

The Bridgeport Brass Company will probably be in their new building about December 1. This is a large addition to their present factory and will increase their production 20 per cent. It will be used principally for making wire for electrical goods, a department to which the company have always paid special attention, being the first to manufacture the hard drawn copper wire now so extensively used.

On the morning of October 28 the Rothery Building, Matteawan, N. Y., was destroyed by fire. The structure consisted of the main building, 40 x 90 feet, three stories high, a wing, 40 x 60 feet, three stories high, a wooden wing, 35 x 80 feet, and a brick wing, 15 x 35 feet, used as a boiler house. John & William Rothery, manufacturers of files, occupied the ground floor of the main building, having their file grinding apparatus and their trip hammer there. Their file factory, being in a separate building, was uninjured. They rented out the remainder of the property to three different manufacturers: Nichol & Jagger, manufacturers of Brussels carpets; the Dutchess Tool Company, manufacturers of lamps or torches for bakers; the Matteawan Felt Company, manufacturers of felt shoes. The Rothery brothers, owners of the building, estimate their loss at about \$30,000, on which there is an insurance of about \$15,000. The fact that their extensive stock of finished goods was practically uninjured leaves them in a position to fill orders promptly. They have already announced their determination to rebuild, and they will doubtless soon be in regular working order again.

Miscellaneous.

The following table, from the Marquette (Mich.) Mining Journal, exhibits in gross tons the total lake shipments of iron ore from the mines of the Marquette, Menominee, Gogebic and Vermilion ranges for the current season up to and including Wednesday, the 3d ult., together with the shipments from the same ports for the corresponding period last year:

Name of port.	1886.	1885.
Marquette.....	894,637	710,552
Escanaba.....	1,400,351	1,138,841
L'Anse.....	.....	20,027
St. Ignace.....	70,042	86,384
Ashland, Wis.....	681,898	94,365
Two Harbors, Minn.....	282,954	28,712
Total.....	3,249,682	2,459,631

The gain over the shipments for the corresponding period of last season is 999,061 gross tons.

The Laconia Car Company, of Laconia, N. H., are negotiating with a Western railroad for the construction of 250 Eastman heater cars.

The St. Charles (Mo.) Car Company have taken their second order from the Colorado Midland Railway for 125 cars.

One of the furnaces at Wolfe, Howard & Co.'s window-glass factory on the South Side, Pittsburgh, caved in on the 5th inst., and will cause the stoppage of the factory for

fully six weeks while a new furnace is being built. All the pots will be lost, and, although the glass in them may be kept hot enough to be worked out, the loss will probably aggregate \$1000 to the firm, besides the loss in wages to the workmen. The cave-in is attributed to the extreme heat from the natural gas fire.

The Litchfield Car Company, at Litchfield, Ill., have received an order from the Texas and Pacific Railway for 200 new freight cars.

About \$15,000 of the stock of the new coal and coke company which propose to operate at St. Clair, Westmoreland County, Pa., has been subscribed.

It is stated that the large car works of McKee, Fuller & Co., at Catasauqua, Pa., will commence operations this fall.

For the first time in seven years Thomas Wightman & Co., of Pittsburgh, have 50 pots at their several factories in operation, making window glass and green bottles. The demand for window glass is greatly improved and all the factories are running, although prices are reported to be very unsatisfactory by the manufacturers.

Our Birmingham, Ala., correspondent informs us that the Coalburg stockholders of the Coalburg Coal and Coke Company on the 5th inst. ordered an increase of capital stock from \$500,000 to \$700,000, and the erection of a 110-ton furnace; at the same time they took into the directory Messrs. J. B. Pace, Joseph Bryan, A. S. Buford, J. H. Dooley and E. D. Christian, all of Richmond, Va., and Mr. W. G. Oakman, of New York. The new capital is to be furnished by these gentlemen and others in New York and Philadelphia interested in the railways of the Richmond and Danville system, with which the Coalburg company is closely allied. This furnace will be an initial venture in its section of the Warrior coal field, and already promises of others soon to follow are heard, though without particulars enough to make them worthy of more than this passing remark. Messrs. Thomas Kearney, of New York; C. D. Reamer, of Oberlin, Ohio, and W. H. Sellers, of Dalton, in the same State, are to join Nashville and Birmingham capital in the Birmingham Bridge Works. These are to have \$250,000 capital stock and an equipment that will make them a formidable competitor for the Ohio concerns, which until recently have been building nearly all the bridges in that part of the country.

An undoubted authority on the subject of lubricating oils is thus quoted by Prof. Hele Shaw: "Bearing in mind the natural and almost ineradicable tendency of animal oils to develop acid, and of vegetable oils by absorption of oxygen to gum and clog bearings, and to induce spontaneous combustion; bearing in mind that mineral oils can now be obtained in every respect as safe as the finest animal oils, and that the admixture of mineral oil with animal or vegetable oil neutralizes the acidity in the one case and the acidity and oxidizing tendency in the other, I am of the opinion that the safest, most efficient and most economical lubricants for all manner of bearings are to be produced by judicious mixtures of animal or vegetable with good mineral oils."

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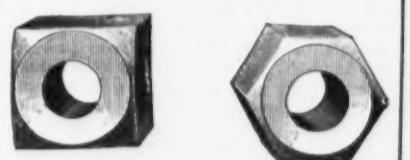
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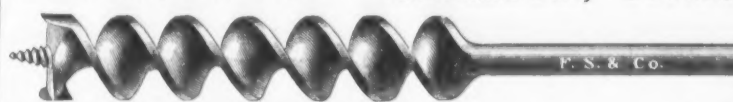
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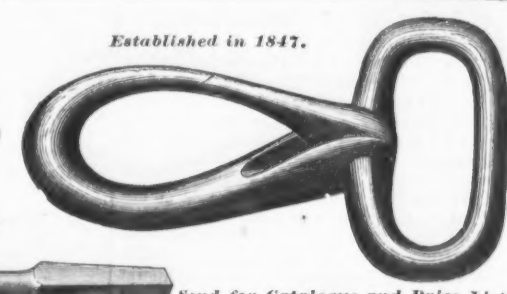
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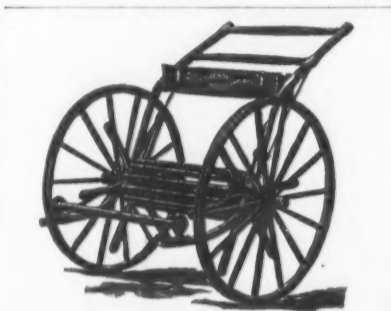


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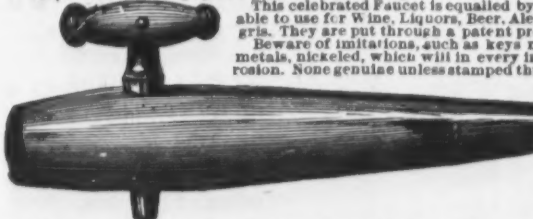
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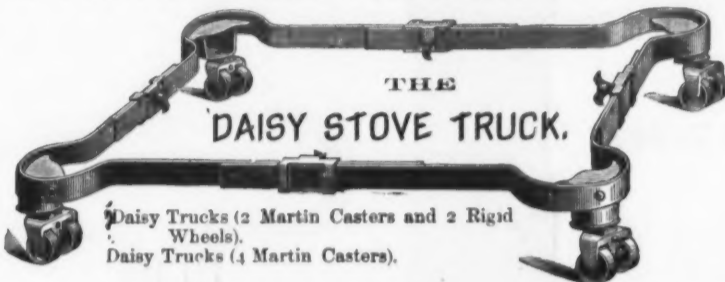
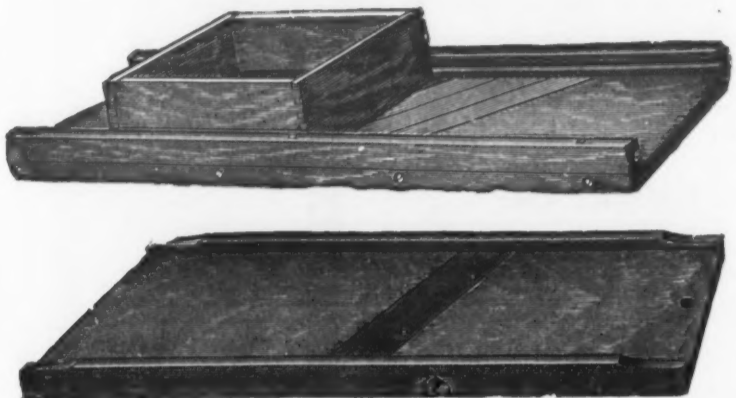
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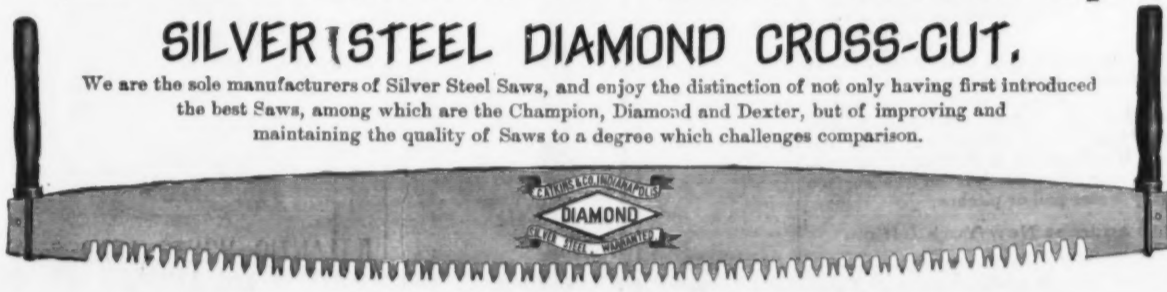
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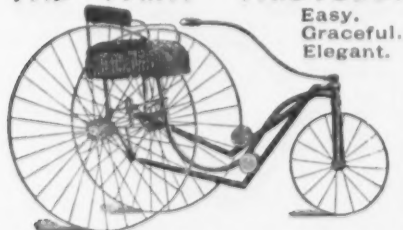
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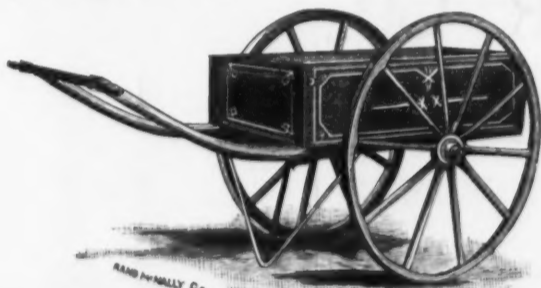
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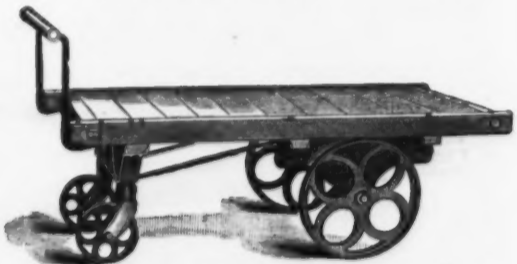
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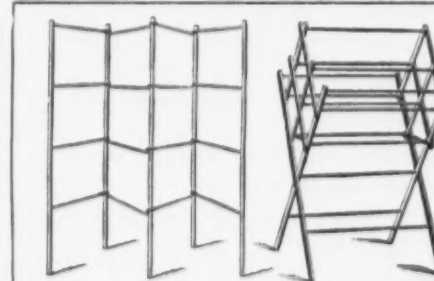
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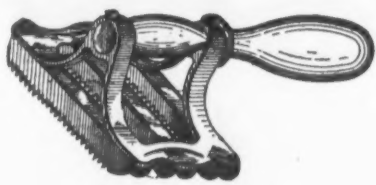
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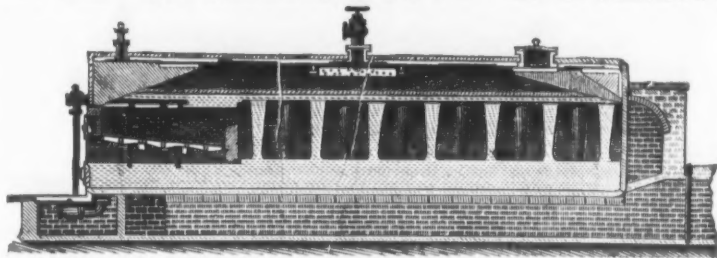
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44	4 "	" "	" " 0.65		84	4 "	" "	" " 0.80	
45	5 "	" "	" " 0.75		85	5 "	" "	" " 0.90	
46 1/2	3 "	" "	Nickel Plated. 1.75		86 1/2	3 "	" "	Nickel Plated. 2.00	
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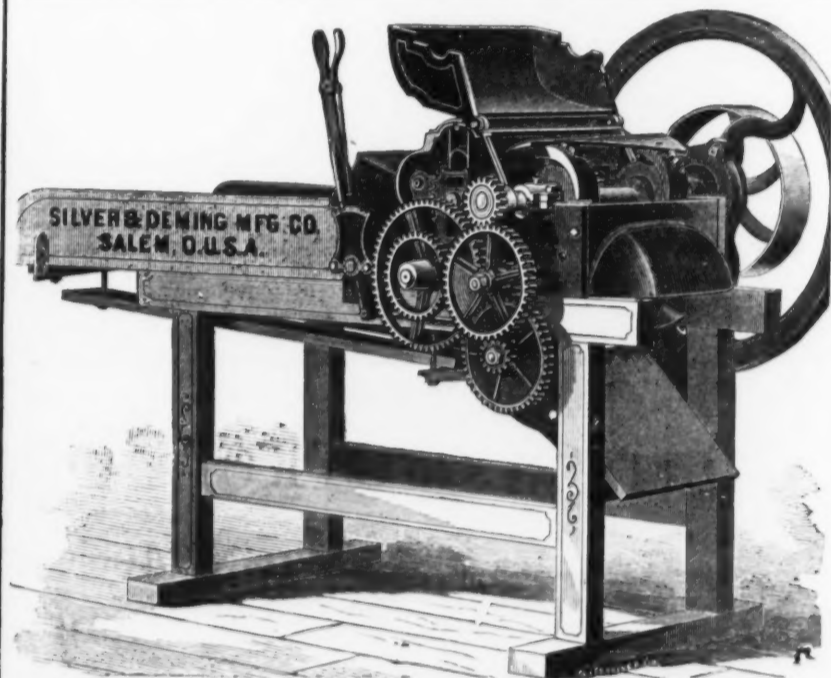
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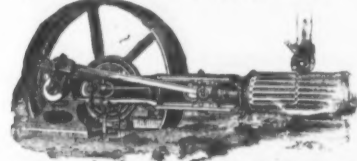
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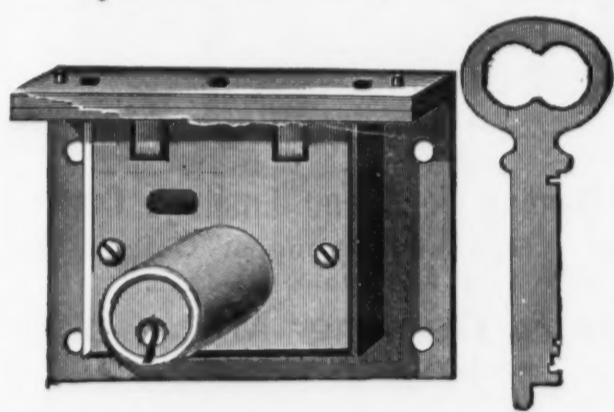
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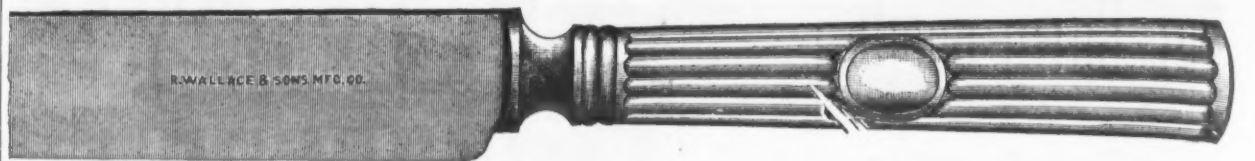
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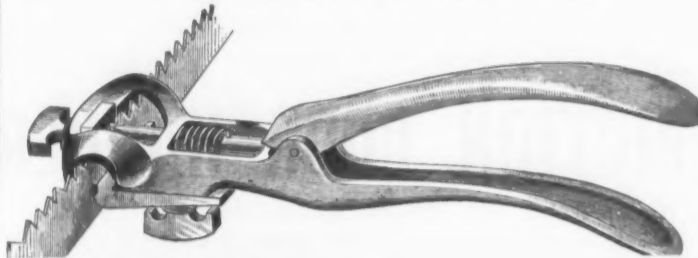
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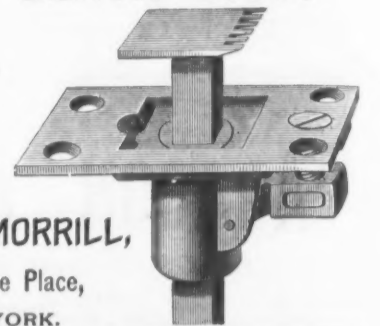
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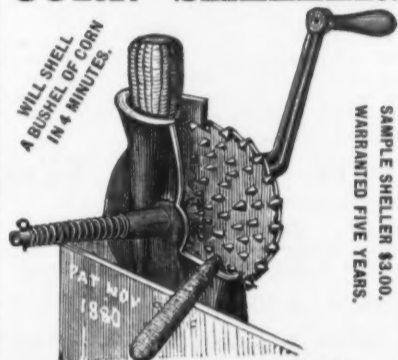
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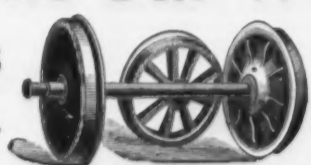
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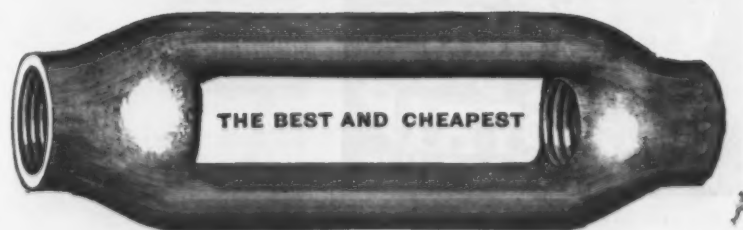
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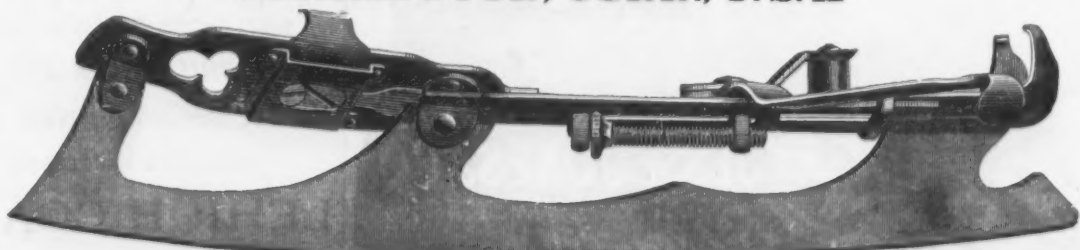
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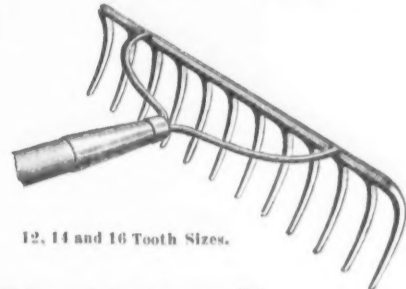
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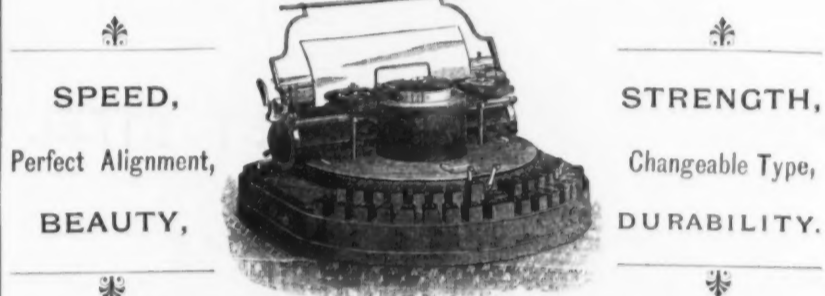
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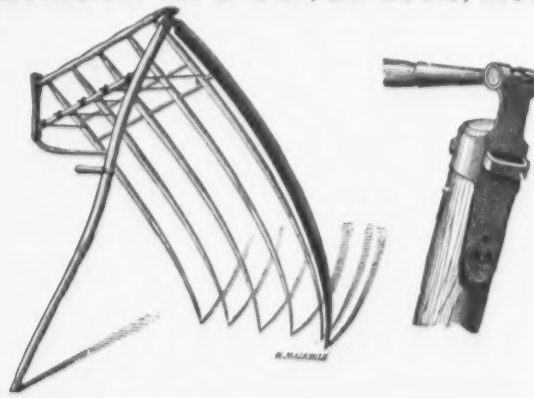
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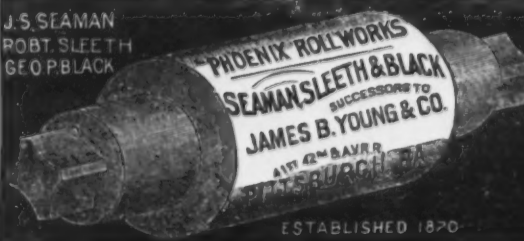
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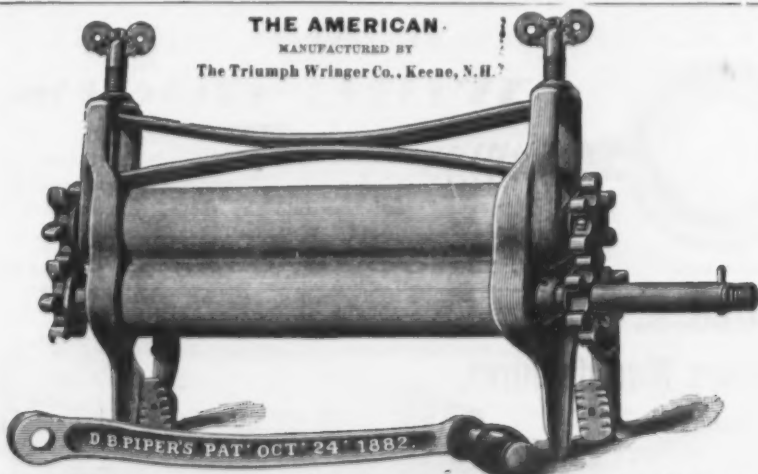


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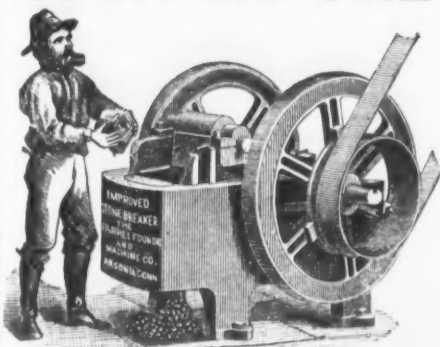
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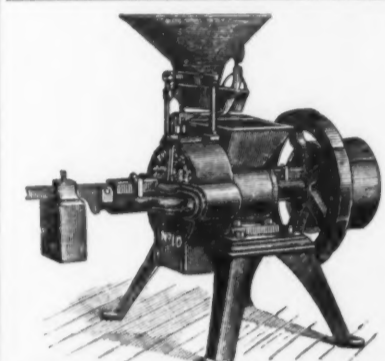
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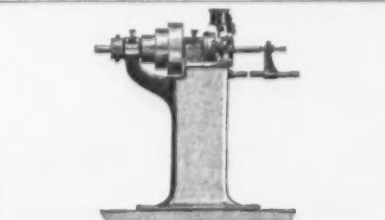


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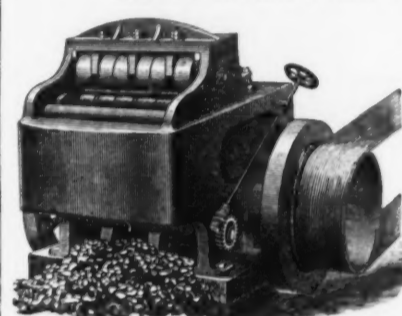
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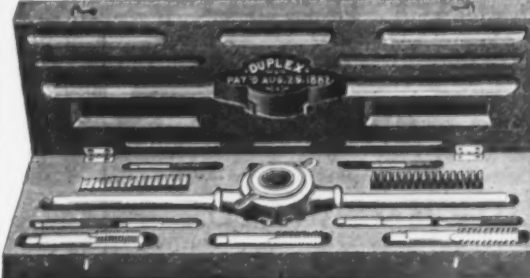
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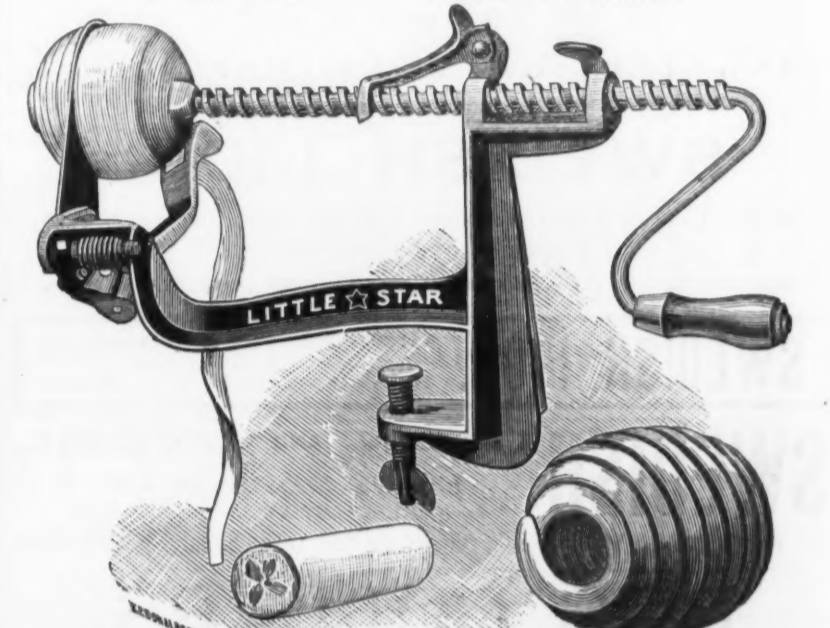
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1886 HUDSON'S 1886
"Little Star" Apple Parer, Corer and Slicer
COMBINED WITH PUSH-OFF.



For paring, coring and slicing, the "Little Star" is the simplest and best made machine in use. It is so constructed that the parings and juice do not fall upon it, but clear from it, and do not clog it up, as is the case with other machines. The knife arm works on a swivel, and always faces the apple when in use. The "Little Star" took the only prize awarded for APPLE PARERS at the Mechanics Fair at Boston in 1884, where there was a strong competition with other makers. Its general "get up" is so novel and unique that we unhesitatingly pronounce it the best Apple Parer, Corer and Slicer ever made.

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IDEAL MOUSE TRAP.

So perfectly simple in construction there is nothing to get out of order, as is the case with all other traps made on this principle. Guaranteed to give perfect satisfaction. Send for sample gross and you will not have any other trap that catches mice alive. The inventor of the ideal invented all of the leading traps in the market to-day, and he says this one is perfection. Great care is taken in the manufacture of the ideal, and every trap is perfect. A single trap for inspection will be sent by mail upon receipt of 20c. in stamps.

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We invite the attention of dealers to this "Novelty" in Mouse Traps. Patented Nov. 6, 1883, and now having an immense sale. It is cheap, durable and attractive, and so sensitive that the mouse that ventures to but touch its nose to the bait box is doomed. Our salesmen on the road say it is the most popular trap ever offered to the trade. One of our men in a single short trip sold 30,000. The retail price is only 10 cents each, and yet they afford big profits to the dealer. We will send a sample by mail for inspection upon receipt of five 2-cent stamps.
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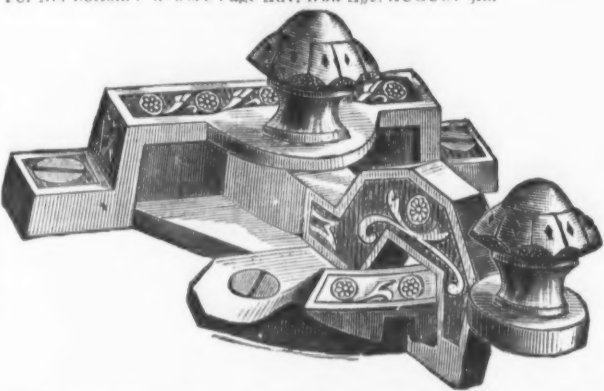
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FOR NET BOTTOM PRICES SEE PAGE AD.
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No. 210, Ornamental Iron, Iron Knob, fine finish, \$0.60
No. 211, Ornamental Iron, Iron Knob, fine finish, \$0.75
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No. 213, Ornamental Iron, Iron Knob, fine finish, \$1.25
No. 214, Ornamental Iron, Iron Knob, fine finish, \$1.50
No. 215, Ornamental Iron, Iron Knob, fine finish, \$1.60
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No. 21, Ornamental Iron, Iron Knob, Nickel-plated, \$1.85
No. 22, Ornamental Iron, Iron Knob, Nickel-plated, \$1.90
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No. 24, Ornamental Iron, Iron Knob, Nickel-plated, \$2.00
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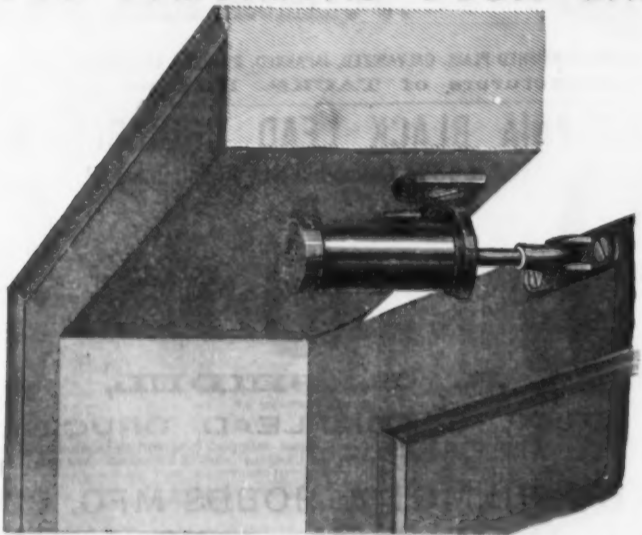


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1 1/2 to 2 in.	\$1.25	\$1.25	\$1.25
2 to 2 1/2 in.	\$1.50	\$1.50	\$1.50
2 1/2 to 3 in.	\$1.75	\$1.75	\$1.75
3 to 3 1/2 in.	\$2.00	\$2.00	\$2.00
3 1/2 to 4 in.	\$2.25	\$2.25	\$2.25
4 to 4 1/2 in.	\$2.50	\$2.50	\$2.50
4 1/2 to 5 in.	\$2.75	\$2.75	\$2.75
5 to 5 1/2 in.	\$3.00	\$3.00	\$3.00
5 1/2 to 6 in.	\$3.25	\$3.25	\$3.25
6 to 6 1/2 in.	\$3.50	\$3.50	\$3.50
6 1/2 to 7 in.	\$3.75	\$3.75	\$3.75
7 to 7 1/2 in.	\$4.00	\$4.00	\$4.00
7 1/2 to 8 in.	\$4.25	\$4.25	\$4.25
8 to 8 1/2 in.	\$4.50	\$4.50	\$4.50
8 1/2 to 9 in.	\$4.75	\$4.75	\$4.75
9 to 9 1/2 in.	\$5.00	\$5.00	\$5.00
9 1/2 to 10 in.	\$5.25	\$5.25	\$5.25
10 to 10 1/2 in.	\$5.50	\$5.50	\$5.50
10 1/2 to 11 in.	\$5.75	\$5.75	\$5.75
11 to 11 1/2 in.	\$6.00	\$6.00	\$6.00
11 1/2 to 12 in.	\$6.25	\$6.25	\$6.25
12 to 12 1/2 in.	\$6.50	\$6.50	\$6.50
12 1/2 to 13 in.	\$6.75	\$6.75	\$6.75
13 to 13 1/2 in.	\$7.00	\$7.00	\$7.00
13 1/2 to 14 in.	\$7.25	\$7.25	\$7.25
14 to 14 1/2 in.	\$7.50	\$7.50	\$7.50
14 1/2 to 15 in.	\$7.75	\$7.75	\$7.75
15 to 15 1/2 in.	\$8.00	\$8.00	\$8.00
15 1/2 to 16 in.	\$8.25	\$8.25	\$8.25
16 to 16 1/2 in.	\$8.50	\$8.50	\$8.50
16 1/2 to 17 in.	\$8.75	\$8.75	\$8.75
17 to 17 1/2 in.	\$9.00	\$9.00	\$9.00
17 1/2 to 18 in.	\$9.25	\$9.25	\$9.25
18 to 18 1/2 in.	\$9.50	\$9.50	\$9.50
18 1/2 to 19 in.	\$9.75	\$9.75	\$9.75
19 to 19 1/2 in.	\$10.00	\$10.00	\$10.00
19 1/2 to 20 in.	\$10.25	\$10.25	\$10.25
20 to 20 1/2 in.	\$10.50	\$10.50	\$10.50
20 1/2 to 21 in.	\$10.75	\$10.75	\$10.75
21 to 21 1/2 in.	\$11.00	\$11.00	\$11.00
21 1/2 to 22 in.	\$11.25	\$11.25	\$11.25
22 to 22 1/2 in.	\$11.50	\$11.50	\$11.50
22 1/2 to 23 in.	\$11.75	\$11.75	\$11.75
23 to 23 1/2 in.	\$12.00	\$12.00	\$12.00
23 1/2 to 24 in.	\$12.25	\$12.25	\$12.25
24 to 24 1/2 in.	\$12.50	\$12.50	\$12.50
24 1/2 to 25 in.	\$12.75	\$12.75	\$12.75
25 to 25 1/2 in.	\$13.00	\$13.00	\$13.00
25 1/2 to 26 in.	\$13.25	\$13.25	\$13.25
26 to 26 1/2 in.	\$13.50	\$13.50	\$13.50
26 1/2 to 27 in.	\$13.75	\$13.75	\$13.75
27 to 27 1/2 in.	\$14.00	\$14.00	\$14.00
27 1/2 to 28 in.	\$14.25	\$14.25	\$14.25
28 to 28 1/2 in.	\$14.50	\$14.50	\$14.50
28 1/2 to 29 in.	\$14.75	\$14.75	\$14.75
29 to 29 1/2 in.	\$15.00	\$15.00	\$15.00
29 1/2 to 30 in.	\$15.25	\$15.25	\$15.25
30 to 30 1/2 in.	\$15.50	\$15.50	\$15.50
30 1/2 to 31 in.	\$15.75	\$15.75	\$15.75
31 to 31 1/2 in.	\$16.00	\$16.00	\$16.00
31 1/2 to 32 in.	\$16.25	\$16.25	\$16.25
32 to 32 1/2 in.	\$16.50	\$16.50	\$16.50
32 1/2 to 33 in.	\$16.75	\$16.75	\$16.75
33 to 33 1/2 in.	\$17.00	\$17.00	\$17.00
33 1/2 to 34 in.	\$17.25	\$17.25	\$17.25
34 to 34 1/2 in.	\$17.50	\$17.50	\$17.50
34 1/2 to 35 in.	\$17.75	\$17.75	\$17.75
35 to 35 1/2 in.	\$18.00	\$18.00	\$18.00
35 1/2 to 36 in.	\$18.25	\$18.25	\$18.25
36 to 36 1/2 in.	\$18.50	\$18.50	\$18.50
36 1/2 to 37 in.	\$18.75	\$18.75	\$18.75
37 to 37 1/2 in.	\$19.00	\$19.00	\$19.00
37 1/2 to 38 in.	\$19.25	\$19.25	\$19.25
38 to 38 1/2 in.	\$19.50	\$19.50	\$19.50
38 1/2 to 39 in.	\$19.75	\$19.75	\$19.75
39 to 39 1/2 in.	\$20.00	\$20.00	\$20.00
39 1/2 to 40 in.	\$20.25	\$20.25	\$20.25
40 to 40 1/2 in.	\$20.50	\$20.50	\$20.50
40 1/2 to 41 in.	\$20.75	\$20.75	\$20.75
41 to 41 1/2 in.	\$21.00	\$21.00	\$21.00
41 1/2 to 42 in.	\$21.25	\$21.25	\$21.25
42 to 42 1/2 in.	\$21.50	\$21.50	\$21.50
42 1/2 to 43 in.	\$21.75	\$21.75	\$21.75
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45 1/2 to 46 in.	\$23.25	\$23.25	\$23.25
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46 1/2 to 47 in.	\$23.75	\$23.75	\$23.75
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48 to 48 1/2 in.	\$24.50	\$24.50	\$24.50
48 1/2 to 49 in.	\$24.75	\$24.75	\$24.75
49 to 49 1/2 in.	\$25.00	\$25.00	\$25.00
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61 to 61 1/2 in.	\$31.00	\$31.00	\$31.00
61 1/2 to 62 in.	\$31.25	\$31.25	\$31.25
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87 to 87 1/2 in.	\$44.00	\$44.00	\$44.00
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89 to 89 1/2 in.	\$45.00	\$45.00	\$45.00
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94 1/2 to 95 in.	\$47.75	\$47.75	\$47.75
95 to 95 1/2 in.	\$48.00	\$48.00	\$48.00
95 1/2 to 96 in.	\$48.25	\$48.25	\$48.25
96 to 96 1/2 in.	\$48.50	\$48.50	\$48.50
96 1/2 to 97 in.	\$48.75	\$48.75	\$48.75
97 to 97 1/2 in.	\$49.00	\$49.00	\$49.00
97 1/2 to 98 in.	\$49.25	\$49.25	\$49.25
98 to 98 1/2 in.	\$49.50	\$49.50	\$49.50
98 1/2 to 99 in.	\$49.75	\$49.75	\$49.75
99 to 99 1/2 in.	\$50.00	\$50.00	\$50.00
99 1/2 to 100 in.	\$50.25	\$50.25	\$50.25

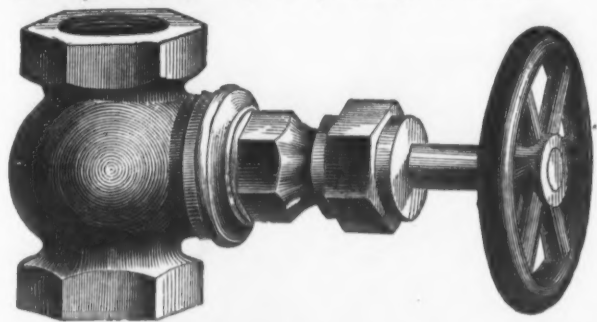
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B

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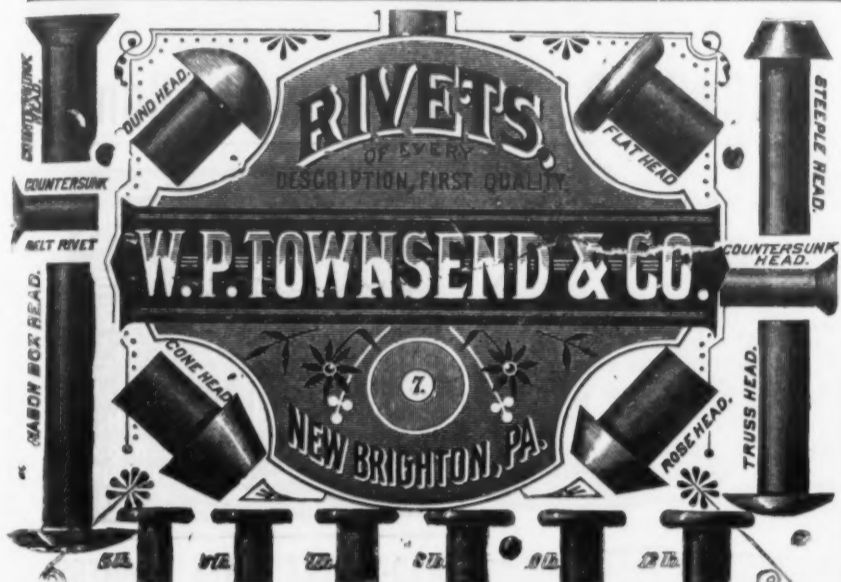
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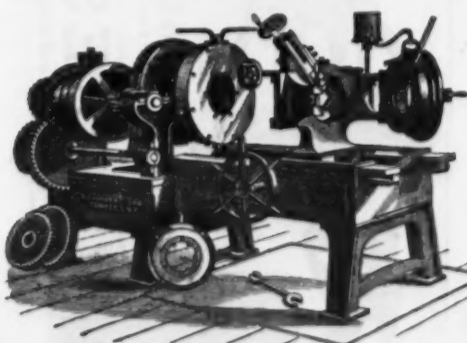
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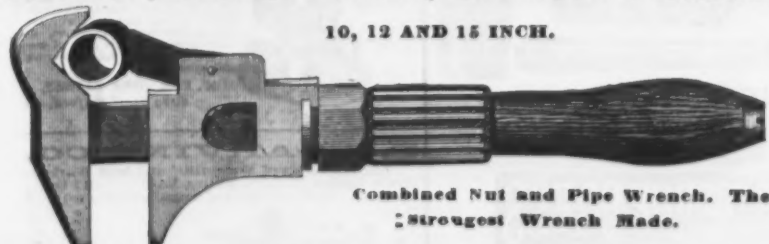
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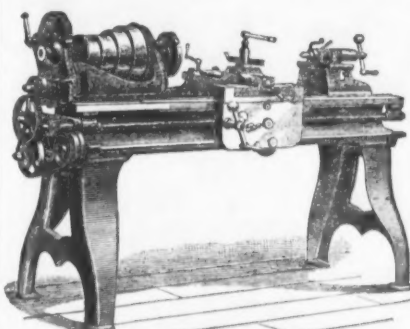
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This Lathe is made with a hollow steel spindle, steel lead screw, steel rack, patent friction rod feed, rests are made either raise and fall or plain gibbed, and lathe with or without taper attachment. Send for Special Description and Price List.

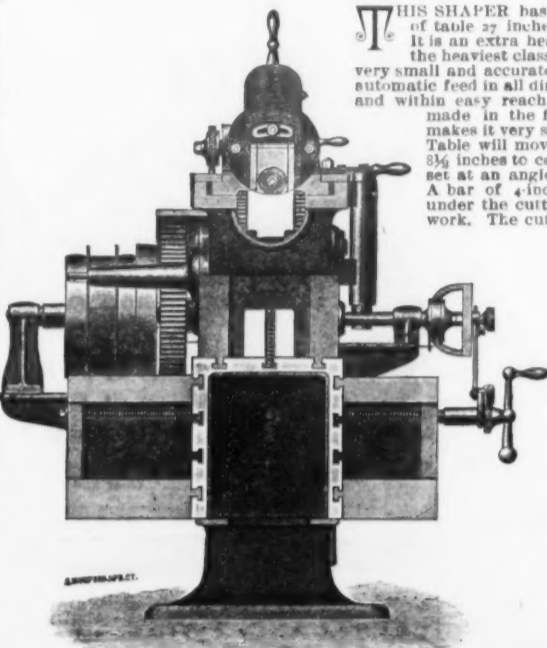
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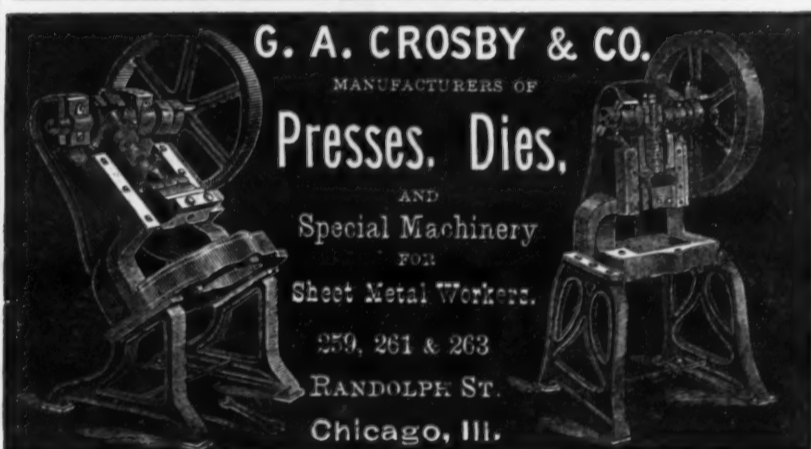


THIS SHAPER has a stroke of 25 inches, cross-feed of table 27 inches, and will plane 20 inches high. It is an extra heavy machine, and is designed for the heaviest class of work, while at the same time very small and accurate work may be done on it. It has automatic feed in all directions, very simple in operation, and within easy reach of the operator. The table is made in the form of a four-sided box, which makes it very strong and solid under a heavy cut. A bar of 4-inch iron may be passed through under the cutter bar for key-seating or other work. The cutter bar is driven by two rack gears of large diameter, on a heavy steel shaft supported on bearings at each end. Driving pinion and gear are on the outside of the machine, allowing the use of extra large gear and increased speed of pulleys, and consequent gain of power on cutter bar. All pinions made of best machine steel.

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Speed of Counter Shaft, 250 revolutions.

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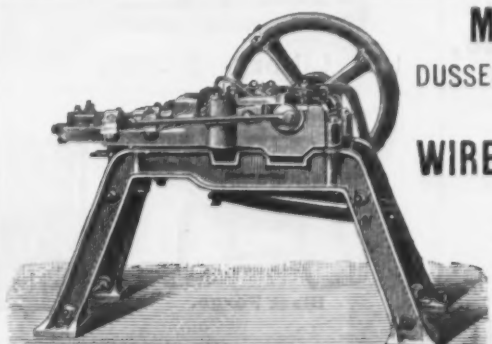
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IMPROVED BY M.M. BARTLETT.
Improvement Patented April 28, 1885.

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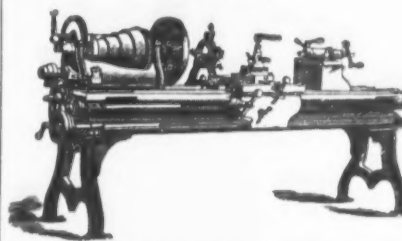
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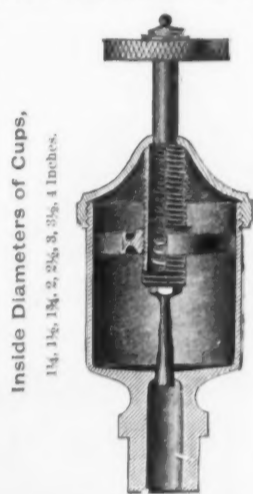
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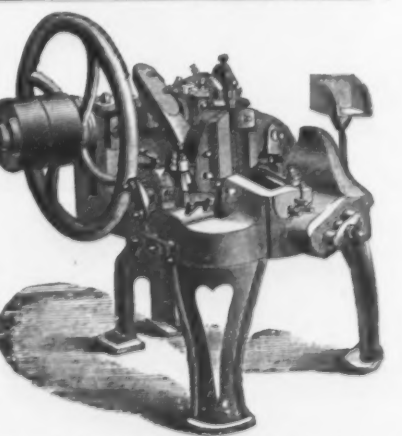
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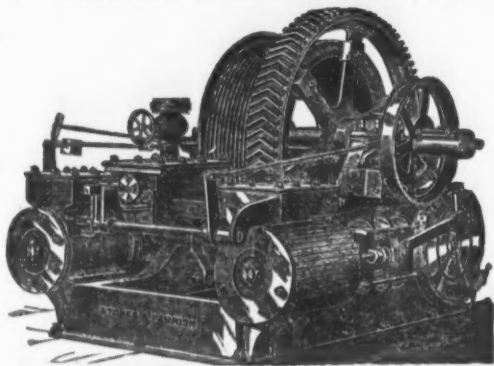


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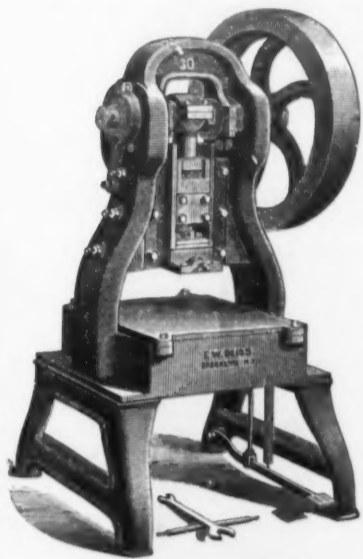
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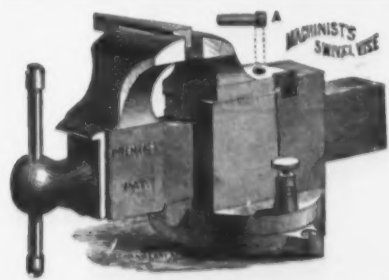
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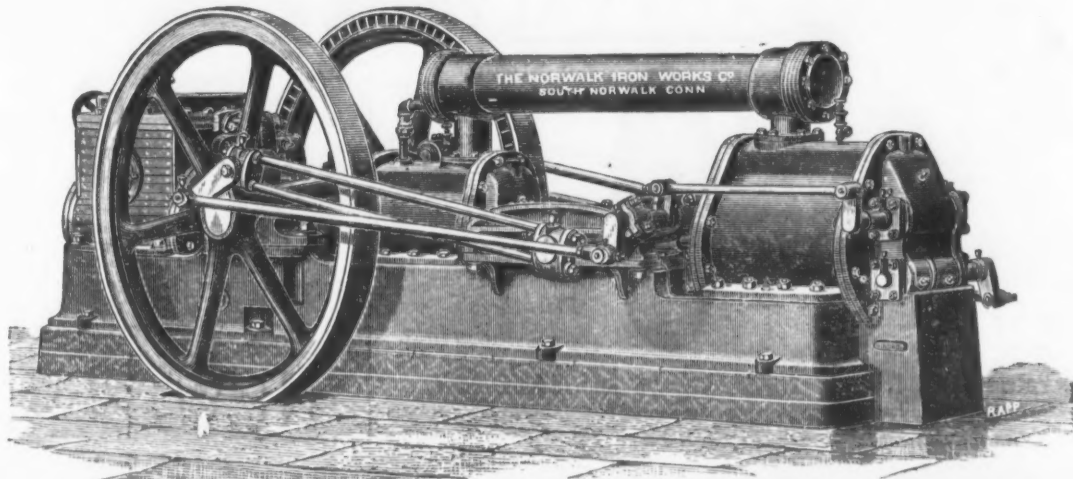
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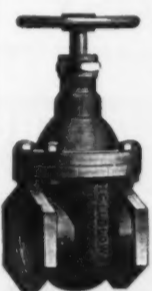
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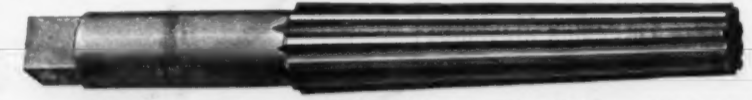
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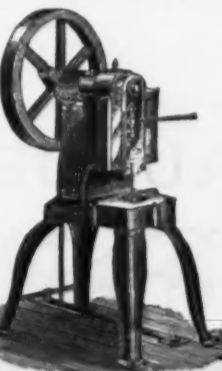
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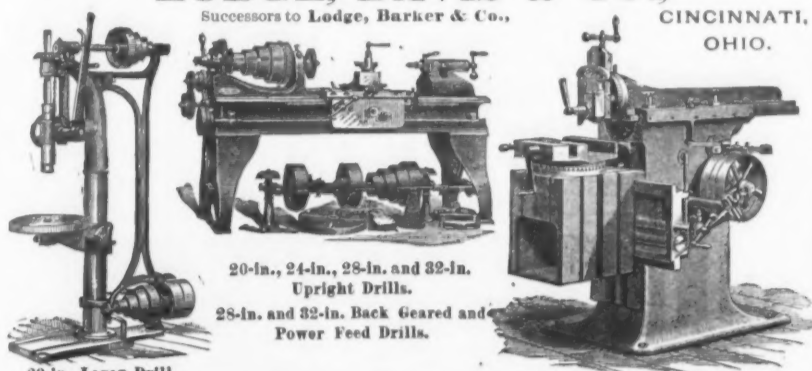
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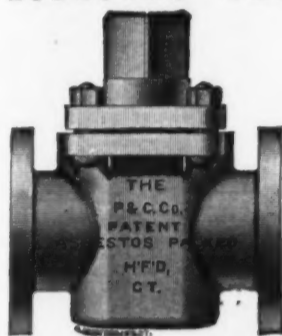
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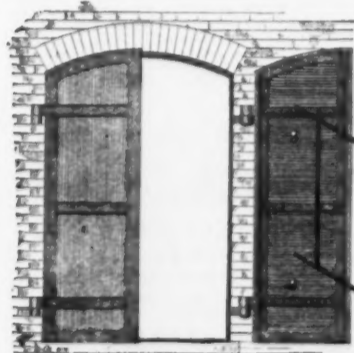
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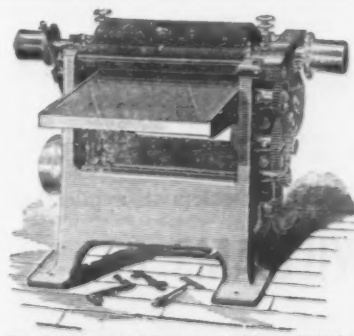
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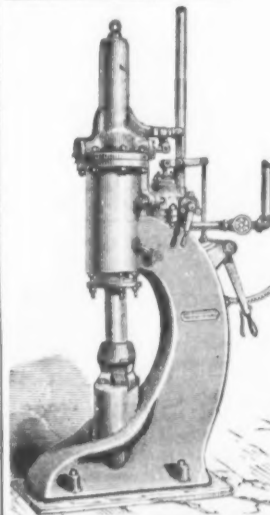
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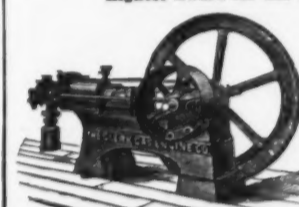
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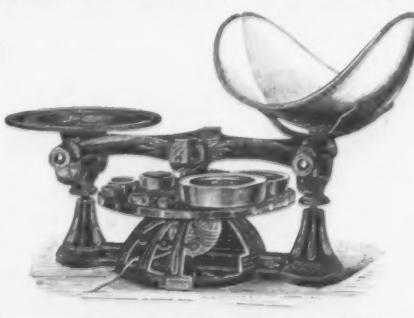
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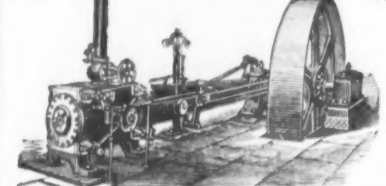
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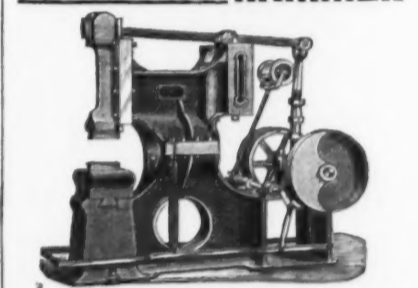
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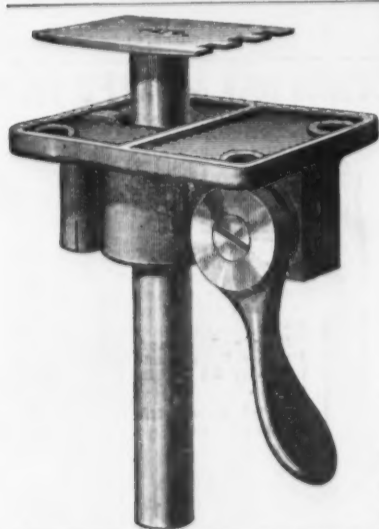
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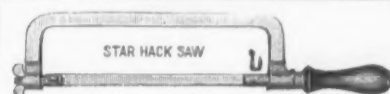
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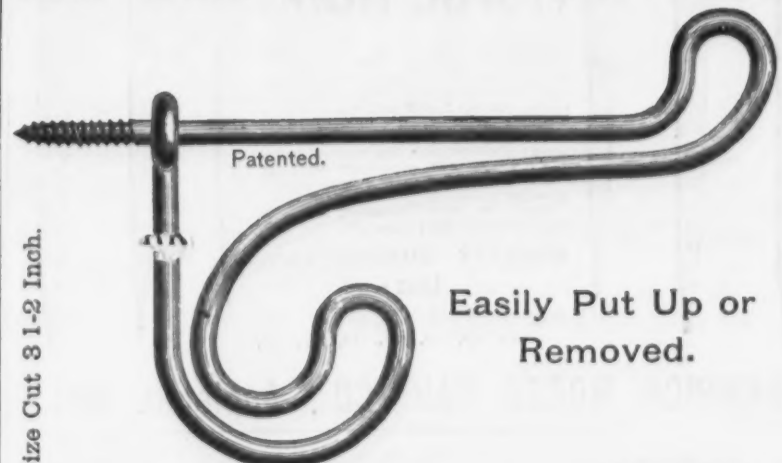
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	2 1/2 inch.....	60	2.15	160	2.00	260	2.65	760	5.20		
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